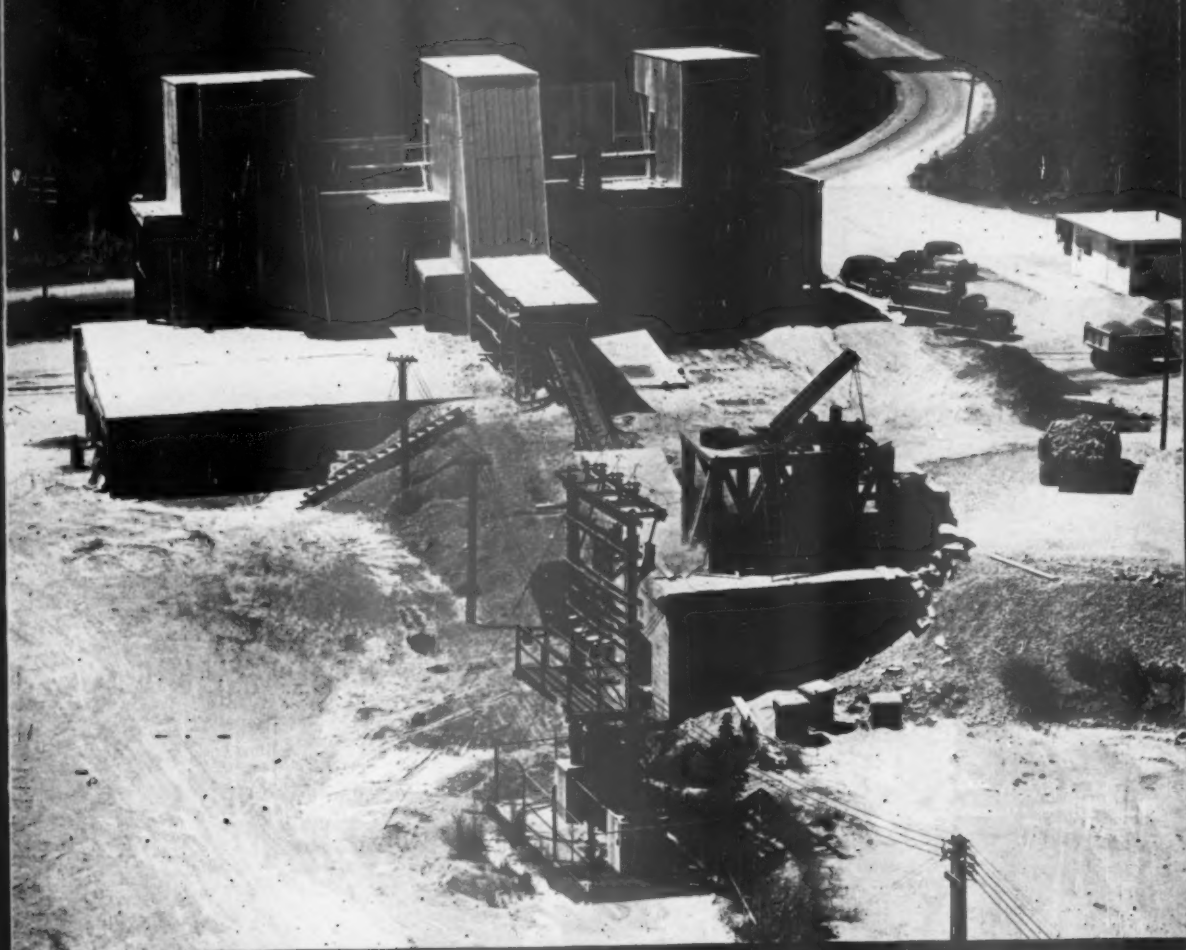
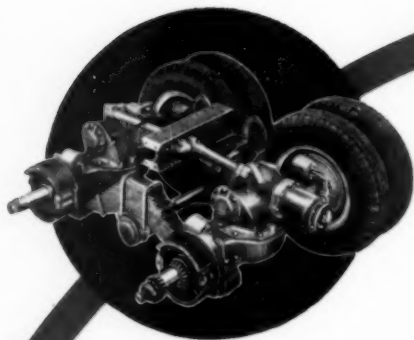


THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD





ONLY MACK offers this matchless Balanced Bogie with exclusive Power Divider. Unusual flexibility and balance insure even tire loading and uniform braking; cancel out weight transfer. Mack Power Divider assures good going by transferring power to wheels maintaining the best traction.



MACK TRUCKS

Built to

take it

...and TAKE IT AWAY

in bigger loads . . . on faster schedules . . . with greater profits

Mack six-wheel trucks are built to "take it" when it comes to taking out the big loads with power and stamina to spare.

Powerful gasoline or diesel engines! Massive, heat-treated alloy steel frames! Flexible rubber Shock Insulators! Air Assist Clutch and Power Steering! Mack's famed Balanced Bogie and Power Divider! These are your assurance of power and strength for the heaviest loads; maneuverability and ease of control for fast loading and unloading; flotation and traction for the most slippery mud or sand.

Whether for heavy highway hauling or super-duty off-highway work, Macks are designed with more outstanding and exclusive features than any other truck—features that mean greater profits through stepped-up tonnage on faster schedules. It will pay you to get the full story in terms of your particular operation. Write or call your nearest Mack branch or dealer.

IT'S PART OF THE LANGUAGE:

Built Like a **Mack** *Truck*

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Limited.

Research keeps
B.F. Goodrich
FIRST IN RUBBER



B. F. Goodrich cord conveyor belt

*Gives 2 to 6 times greater impact resistance,
troughs better, lasts longer*

IN the cord plies of a B.F. Goodrich belt each cord is completely surrounded by rubber—no cross threads tie them together. These parallel cords are completely insulated from one another by rubber, free to "give" lengthwise and crosswise when an impact occurs. Thus the rubber can distort temporarily to distribute and absorb shocks that would damage a stiff, unyielding carcass. This augmented impact cushion means better belt service, longer belt life.

Cord belts trough better—Cord belts carry the load with less belt damage, less material "spill." Even

thick, narrow cord belts trough naturally. And because they trough better, cord belts keep centered on the idlers, sustain less damage, require less maintenance. Longer centers, higher lifts can be used. Creasing action between idlers (as in a fabric-type belt) is eliminated.

Cord belts last longer, reduce costs—The better impact cushion of cord construction resists cuts and gouges. A transverse cord "breaker" floated above and across the main cord section helps cushion impact, keeps the cover from stretching beyond elastic limits, and provides better adhesion between cover

and carcass. With each cord completely sealed in rubber, this BFG belt resists the effects of acid materials, moisture, mildew.

Cord belts for tough jobs—If your belts must take severe impact on loading or "over the idlers," cutting and gouging at the loading chute, exposure to moisture and acid materials, heavy loads with long centers and high lifts, you need BFG cord belts. Your local distributor will show you how they can save you money. *The B.F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich
RUBBER FOR INDUSTRY



Bror Nordberg
Editor

Nathan C. Rockwood
Editorial Consultant

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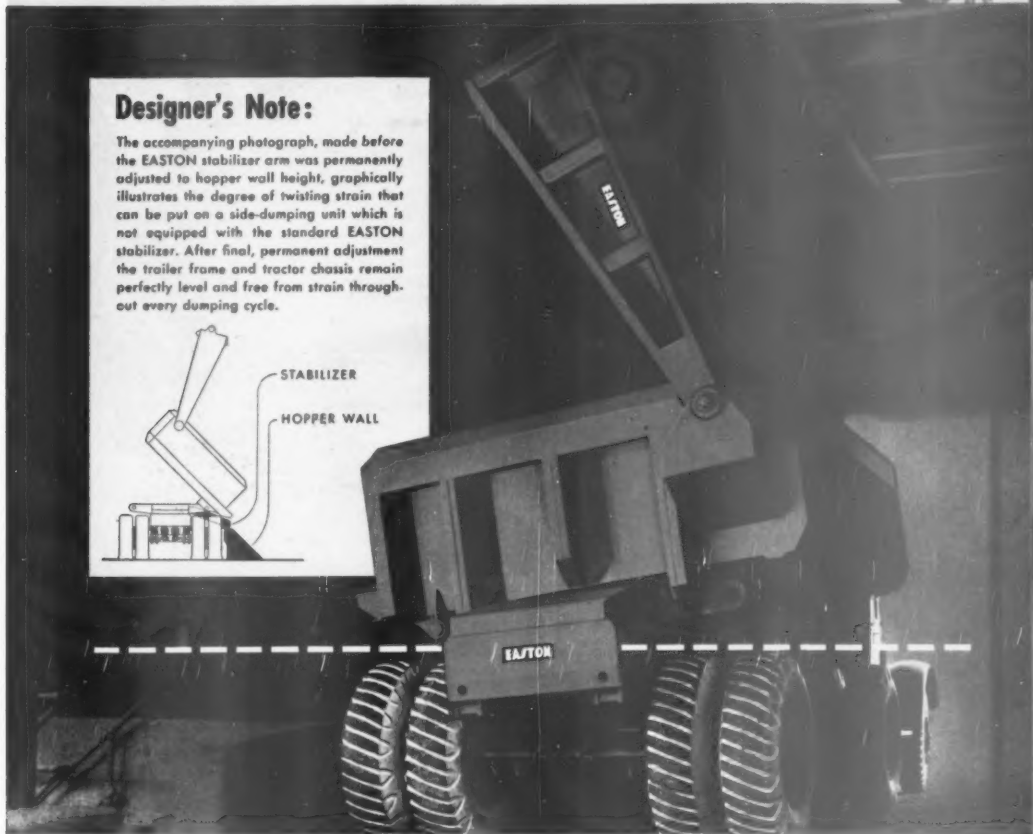
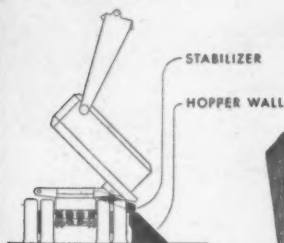
The Sensational New MODEL TL

Illustrating the large capacity lift-door trailer recently introduced by EASTON and now entering service in cement plant and iron mining operations. Available in capacities to thirty tons, or larger. Dumped by automatic overhead hoist.



Designer's Note:

The accompanying photograph, made before the EASTON stabilizer arm was permanently adjusted to hopper wall height, graphically illustrates the degree of twisting strain that can be put on a side-dumping unit which is not equipped with the standard EASTON stabilizer. After final, permanent adjustment the trailer frame and tractor chassis remain perfectly level and free from strain throughout every dumping cycle.



Dollars and Sense...

Shovel to crusher quarry haulage is a highly specialized operation. It affords a clean-cut opportunity for time and cost study, and for the application of highly efficient, special purpose methods and equipment. That's why haulage costs can be so extremely low with EASTON Special Purpose Trailers. For a free time and cost study of EASTON Trailer Haulage on your property, write to: Easton Car & Construction Company of Easton, Pa.

B-1033

PATENTED
DOORLESS PAN



Model TB • 14 to 20 tons

PATENTED
LIFT DOOR



Model TL • 20 to 30 tons

PATENTED
DROP DOOR



Model TD • 20 to 30 tons

SPECIAL PURPOSE

EASTON
Trailers

Makers of Easton Mine and Quarry Cars
and Easton Heavy-Duty Truck Bodies



50th birthday of the
company whose products you know
by the trade-mark: **TIMKEN**

SINCE 1899 THE TIMKEN ROLLER
BEARING COMPANY HAS BEEN
HELPING AMERICAN INDUSTRY
GET THE MOST FOR ITS MONEY

NOBODY likes to buy a "pig in a poke". In America you don't have to. You're protected by trade-marks like "TIMKEN".

Registered as a trade-mark in the United States Patent Office, "TIMKEN" identifies products made by The Timken Roller Bearing Company: Timken tapered roller bearings, Timken alloy steels and seamless tubing and Timken

removable rock bits.

Experience over the years has shown Timken products to be the finest in their respective fields. And many thousands of men and women are working hard to keep them that way. No wonder it has become a habit throughout industry to look for the trade-mark "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

It doesn't matter what kind of **MINING!**

*...there is a
Northwest
for the job!*

Perhaps your problem is overburden! Perhaps it is one of feeding a doodlebug or maybe it's a plain hard rock job! Whatever it is there is a place in the heart of your job where a Northwest will cut your costs.

Northwests bring you a combination of features found in no other Shovel, Crane or Dragline. Northwest Crawlers, with their self-cleaning type of action, give less trouble in the pit. The "Feather-Touch" Clutch Control is simple, positive, and with it your machine can't be shut down because of control failure.

The Northwest Dual Independent Crowd utilizes force other independent crowds waste, assuring greater capacity and ability in rock digging. The Cushion Clutch, Uniform Pressure Swing Clutches and other Northwest advantages combine for lower cost operation and reduce "down time."

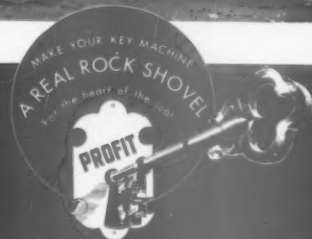
You can't afford anything but the best in the heart of the job and you *can* plan ahead to have Northwest equipment. Let us give you details and tell you how.

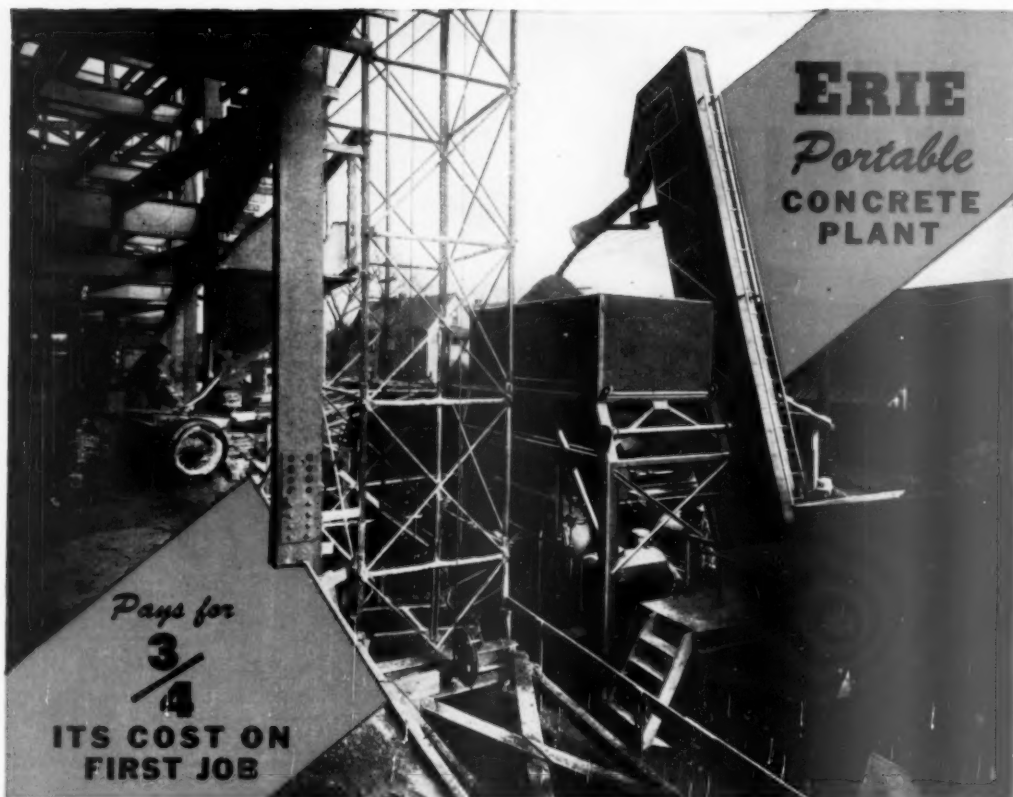
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1514 Field Building, 135 South LaSalle Street
Chicago 3, Illinois



NORTHWEST

Convertible for any Mining Material Handling or Excavation Problem





SIEGFRIED CONSTRUCTION CO. *Making Concrete on the Job* AT TRICO PLANT, BUFFALO, N. Y.
5 FLOORS • 5000 YDS • HIGH TEST CONCRETE

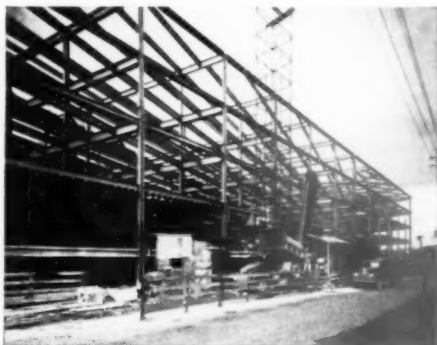
THIS Erie Portable Concrete Plant discharges each 1 yard batch to tubular tower, keeping buggy gang moving at top speed just behind the form builders and reinforcing bar teams. Aggregates are hauled 9 miles. Bag cement is stored under cover at the machine. One man operates weigh-batching of aggregate and water. Hydraulic control of all gates permits finger touch action. Second man feeds bag cement and supervises aggregate unloading to truck hopper which discharges to 60 ton/hr. vertical bucket elevator. Owner reports "a substantial saving on concrete laid will be effected on this 5,000 yard job". Mounted on 8 pneumatic tires the plant can be quickly knocked down and towed to the next job. Let's have your concrete making problem.

ERIE

Write for specific data on the Erie Portable Concrete Plant for your work.

STEEL CONSTRUCTION COMPANY

796 GEIST ROAD • ERIE, PENNSYLVANIA



General view of Trico Plant showing 2nd floor of concrete being laid. The Portable Concrete Plant next to the building does not obstruct traffic.





CURVED JAWS...

FOR GREATER CRUSHING EFFICIENCY IN THE TRAYLOR TYPE R JAW CRUSHER

This cut-away of a Traylor Type R Crusher shows clearly the advanced design characteristic of all Traylor-built equipment. Each feature contributes to larger profits through higher production with lower power and maintenance costs. The Type R Crusher, built in five sizes up to 56" x 72", is completely described in illustrated Bulletin 123 shown below.

1—The Meehanite® metal frame is of box section design which provides maximum strength per pound. Uniform metal thickness and annealing in sand insure castings free from flaws, shrinkage cracks and checks.

2—Heavy steel reinforcing rods are shrunk in place on each side at the top of the crushing chamber and through the strengthening band at the bottom of the frame.

3—Forged steel rods of extra large diameter make up a very strong pitman which is relatively light in weight.

4—The exclusive Traylor swing jaw suspension holds the swing jaw shaft in a fixed position. This materially reinforces the top of the frame.

5—The non-chokable, smooth-face curved jaw plates, of patented Traylor design, keep horsepower per ton requirements low. Made of manganese steel, they outwear conventional plates, often by as much as 3 to 1.

(* Reg. U. S. Pat. Off.)



TRAYLOR

JAW CRUSHERS

Gyratory Crushers • Reduction Crushers
Feeders • Kilns • Coolers • Dryers
Grinding Mills • Crushing Rolls

Write today for your copy of Bulletin 123. See how curved jaw plates can increase your profits by reducing your crushing costs.

TRAYLOR ENGINEERING & MANUFACTURING CO.
152 M'K Street, Allentown, Pa.

Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

A "Traylor" Leads to Greater Profits



Left, two JOY L-47's working in a pipe-lineditch. The L-47 weighs 45 lbs., and can easily drill to 10 feet or more.

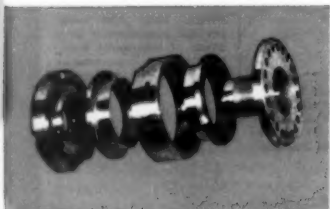


Above, the 55-lb. JOY L-57, for heavy-duty drilling to 15 ft. or more.



Left, the JOY L-37, a hard-hitting 35-lb. drill for depths to 8 ft.

Faster, harder *PUNCH* gives you more footage!



Famous JOY DUAL VALVE makes air do more work



SAVE TIME with JOY THRO-WAY BITS

W&O C2045

JOY *SILVER STREAK*

CADMIUM-PLATED DRILLS

The exclusive features of JOY "Silver Streak" Drills—cadmium plating and the famous "Dual Valve"—mean just this to you: faster drilling and less cost per foot of hole—smoother operation, easier on the drill-runner—longer service life and less maintenance. ● Prove these advantages for yourself—write for bulletins, and let us arrange a demonstration for you on the job!

Consult a Joy Engineer



JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



Type R Crusher Sizes for
1 to 5½ in. Feed.

Nine Years on the Job... Crushing Tough Trap Rock

INSTALLED IN 1940 by Bird and Sons, E. Walpole, Mass., this *Type R* gyratory crusher has been in operation 24 hours most days reducing hard, abrasive trap rock for roofing granules.

Trap rock is tough on crushers. Yet, so little "time out" for maintenance has been required since this machine was installed that these owners say it does a remarkable job for this kind of work.

In the modern *Type R* crusher, Allis-Chalmers has achieved both maximum strength and the elimination of excessive weight. It's built of sturdy steel construction with wearing parts made of heat-treated manganese steel. Fully automatic flood-lubrication of moving parts contribute to long operating life. Resilient mountings protect crusher and building from destructive vibration.

Type R crusher gives you maximum

crushing capacity. That's due to the scientifically shaped crushing chamber... which also results in a more cubical product.

MAINTAINS EXACT PRODUCT SIZE

It's a topnotcher in operating convenience, too. "Speed-Set" control of crusher setting permits adjustment to exacting product size with turn of hand crank... easily, without stopping crusher!

Automatic Reset lowers the entire crushing head hydraulically to pass tramp iron and other uncrushable materials... then brings it back to previous setting smoothly and without shock.

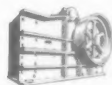
Find out more about *Type R* crusher's cost-cutting advantages from the A-C representative in your area, or write for Bulletin 07B6006E. A-C offices or distributors in principal cities in the U.S. and throughout the world.

ALLIS-CHALMERS, 975A SO. 70 ST.
MILWAUKEE, WIS.

A2653



Kilns, Coolers, Dryers



Jaw Crushers



Hoists



Mills



Gyratory Crushers



Vibrating Screens

AND OTHER EQUIPMENT
FOR THE CRUSHING, CEMENT
AND MINING INDUSTRIES

Speed-Set is an Allis-Chalmers trademark

ALLIS-CHALMERS

ROCK PRODUCTS. June, 1949

THIS HEAVY-DUTY OIL HELPS YOU CUT

DELVAC OILS

PROVED

performance under toughest conditions!

APPROVED

**by 28 crane, shovel and dragline makers —
10 tractor and 45 bus-truck builders!**

● Delvac "900 Series" Oils are specially designed to keep your truck, tractor and other automotive-Diesel and carburetor-type engines on the job, working full time.

They're famous *heavy-duty* oils—give full engine protection throughout the entire operating temperature range...possess rich lubrication films that provide full piston ring seal, minimize blowby, reduce friction.

Delvac "900 Series" Oils combine exceptional oxidation resistance with special detergent properties to help keep engines clean. Contaminants remain in suspension, are easily removed by periodic crankcase draining. High resistance to chemical change protects hard alloy bearings against corrosion.

* * *

Get correct lubrication! Use Delvac Oils!



DOWN-TIME... BEAT CONTRACT DEADLINES!



**"160,000
miles with Delvac"**



● One large operator of heavy-duty trucks reports his fleet averages 26,000 miles weekly at ungoverned speeds. He maintains a rigid lubrication and inspection schedule every 2,000 miles. The bearing shown above was photographed after 160,000 miles of service on Delvac Oils... unusually long life made possible with *Correct Lubrication!*

SOCONY-VACUUM OIL COMPANY, INC.
and Affiliates: MAGNOLIA PETROLEUM CO.,
GENERAL PETROLEUM CORPORATION

SOCONY-VACUUM

Contractors' Service

**Keeps machines on the job...
Speeds work progress!**



"Clothespin Contact"...

in the new G-E Motor Control Center
marks new advance in starter design



No wiring from starter to bus necessary with this new feature. Simply put the starter in place . . . and the stabs automatically engage the bus bars in quick, positive connection.

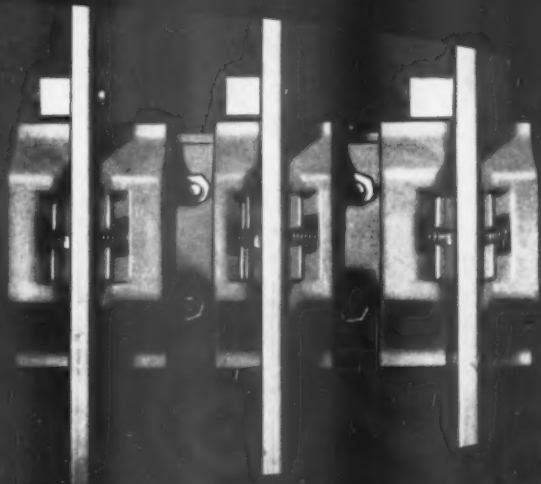
SAVES SPACE This compact centralized motor control system permits you to put all of your control in one spot—simplifies installation, interconnections, and maintenance. Control centers are only 12 inches deep, all wiring is front-connected so units may be placed back to back, in an "L" shape or flush against the wall.

INTERCHANGEABLE

All vertical sections are the same size, all starter units are proportionate. No special engineering is necessary to plan your own G-E control center. To make it even simpler—starter units for motors from 1 to 25 horsepower have the same overall dimensions.



GENERAL  **ELECTRIC**

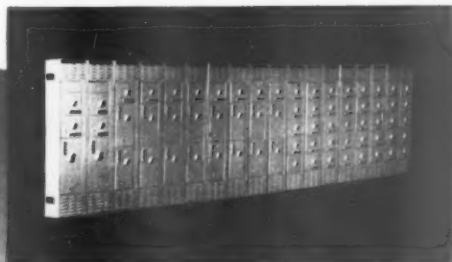


tion. For emergency handling, the starter can be removed without de-energizing the power bus after a simple removal of the supporting bolts.



PLAN YOUR OWN G-E MOTOR CONTROL CENTER

Contact our sales engineer at the nearest G-E office for copies of an easy-to-use planning chart—or write us for bulletin GEA-4979 which contains additional information. Apparatus Dept., Section 676-263, General Electric Company, Schenectady, New York.



Cut Costs

Not tied down to specialized duty —



LOADING FROM PIT



LOADING SNOW



PLOWING SNOW



WINCH AND HOIST WORK



PULLING SCRAPERS



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FEEDING ASPHALT AND CRUSHER PLANTS



BUILDING SANITARY FILLS



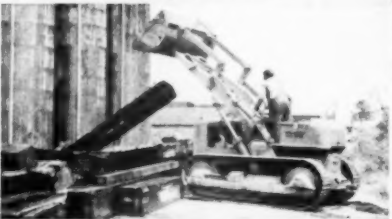
HANDLING COAL



GRADING HOMESITES



FLOOD CONTROL



LIFTING WORK



CLEANING BEACHES

A
Great Tractor
WITH A
GREAT ALLIED LINE

Available with fully matched Baker, Gar Wood and Carco bulldozers ... Drott Skid-Loader ... Baker snowplow ... Gar Wood scraper ... Carco winch ... Tractomotive Tracto-Shovel with interchangeable attachments—1 cu. yd. standard bucket, ¾ cu. yd. narrow bucket, 2 cu. yd. light materials bucket, 1 cu. yd. rock bucket, 1 cu. yd. magnesium bucket, teeth for all buckets, heavy-duty bulldozer blades (narrow and wide) and V-type snowplow.

On All Kinds of Work.

WITH THE VERSATILE
ALLIS-CHALMERS

HD-5

Completely New
IN DESIGN

New Performance ...

New Work Capacity ...

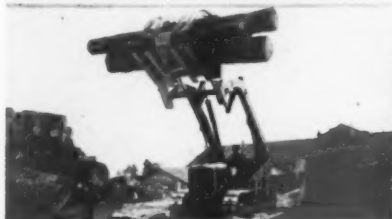
New Simplified Servicing

Weights 11,250 lbs.

Provides 40.26 drawbar hp,
50.25 on belt

2-Cycle GM Diesel Power

— Yet gives special performance on every job



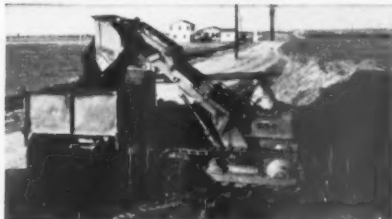
HANDLING TIMBER, LUMBER, ETC.



BACKFILLING



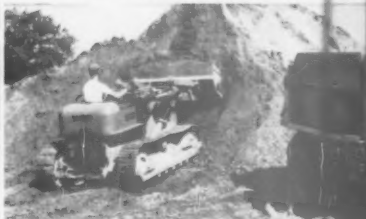
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ROAD AND STREET MAINTENANCE



LOADING LIME



LOADING SAND



CRANE WORK



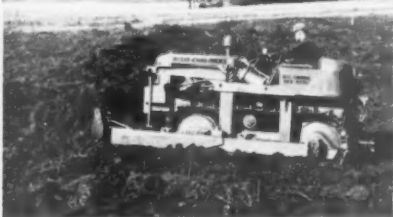
LOADING ROCK



LOADING GRAVEL



DIGGING BASEMENTS, CULVERTS, ETC.



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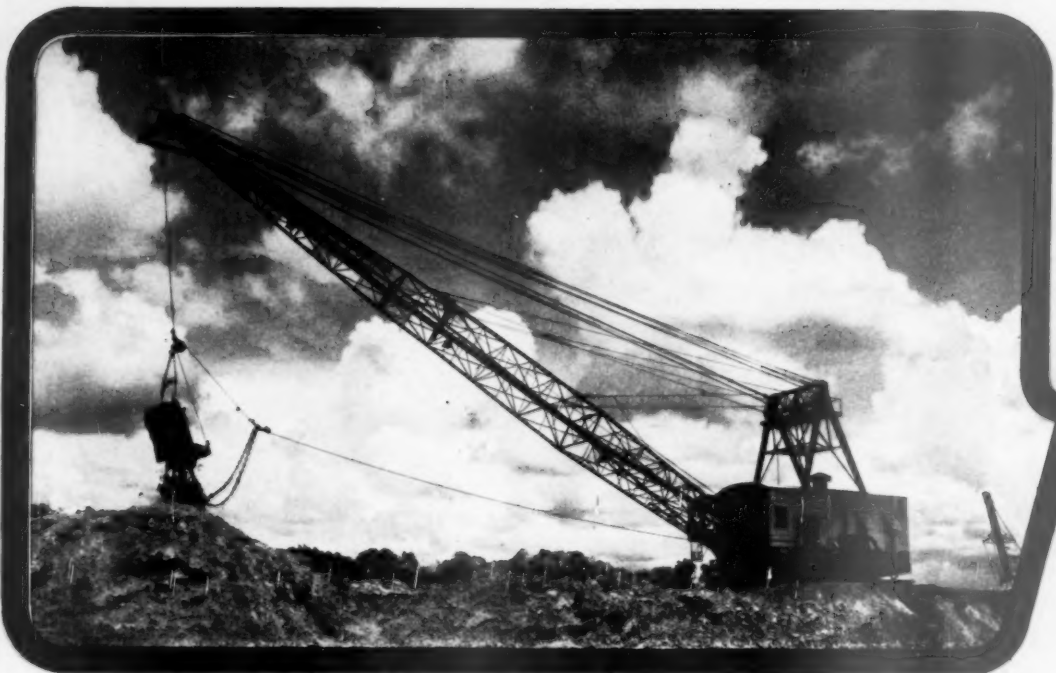
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ALLIS-CHALMERS

TRACTOR DIVISION

MILWAUKEE 1, U. S. A.

Now! When You Order Forget



Tests Prove Service Life of Tuffy is Greater

"After moving 1,834,000 cu. yds., the superintendent is very pleased with Tuffy Draglines, especially because they are digging back from a very steep slope in a 70 ft. hole under tough abrasive action. On basis of this performance, another set of 2½", 280' Tuffys, a set of 2", 225' Tuffys and a 2½", 216' and 2½", 224' Tuffy for a twin drag machine have been ordered to replace competitive ropes."

"Tuffy Dragline's ruggedness gave well over 300 percent improvement in performance plus considerable time saved changing lines."

From all parts of the country, replies such as these verified the claims made by Union Wire Rope engineering specialists who

designed Tuffy Draglines. In-the-field tests were made under severe operating conditions where Tuffy handled many types of material on different equipment. Tuffy's extra flexibility, abrasive resistance and stamina were challenged in digging, casting, and loading operations. Yet results of the tests were the same in all cases: Longer Life, Better Performance, Greater Economy.

Tuffy is a special rope for any and all dragline jobs. It is designed by the same specialists who have made hundreds of other Union Wire Rope products the standard of quality in the construction field.



union

Wire Rope

DRAGLINES . . . Everything Except

the **NAME** **Tuffy**

the **SIZE** ? inch

the **LENGTH** ? feet



Tuffy DRAGLINES

**are Built Tough to Meet all
Operating Conditions**

Extra flexibility and maximum abrasive resistance are built into Tuffy Draglines to assure dependable performance on any type of equipment—handling any type of material. Wet and dry dirt, sand, rock, gravel, cement, minerals, all give way to Tuffy's structurally tough construction. At high speeds or low speeds, Tuffy Draglines give top operating efficiency; they hold securely to drum when casting, ride better on grooves and are easier and safer to use. Put Tuffy to the test! He's built tough!

Just These 3 Specifications

Tuffy . . . Size . . . Length—that's all you order to get the **RIGHT** dragline for your particular job. No more confusing specifications, only to end up with a rope that is restricted to use under limited operating conditions. Now—in one simplified order—you get Tuffy Draglines designed to give maximum performance in *all* operations.

Always specify Tuffy when you order.
(Example: 225' 1 3/4" "Tuffy" Dragline). Mail coupon today for illustrated folder.

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☐ Send Complete Illustrated
Folder on Tuffy Draglines.

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CITY ZONE

STATE

For Tuffy Draglines — See Your
Union Wire Rope Distributor
(Listed in Yellow Section of Your
Telephone Directory) and/or Send
This Coupon.

KOEHRING DUMPTOR

**No body hoist trouble . . .
extra yardage every shift**



KOEHRING SHOVELS keep up with DUMPTOR SPEED



Koehring 304 (1 3/4 yard) Rock Shovel:
Heavy Duty leader in 3/4 yard class. En-
closed gears run in continuous oil bath.



Koehring 605 (1 1/2 yard) Rock Shovel: Exclusive
power clutch eliminates operator fatigue. Boom-
foot shock absorber permits greater speed in rock.

DUMPS IN 1 SECOND

Pull the release lever and gravity instantly tips the scoop-shaped body 90 degrees. One second later, load is dumped . . . you're ready to go for another load.

You don't waste 10 seconds, 20 seconds, 60 seconds. Kick-out pan keeps body clean in any material.

Because Dumptor has no body hoist, you have no body hoist trouble. Dumps fast even in zero weather. Saves all body hoist maintenance expense.

NO TURN-TIME, MORE HAUL-TIME

You save more seconds every trip, because Dumptor never turns on shuttle hauls. Three reverse speeds are just as fast as three forward speeds. Constant mesh transmission is especially designed for shuttle work.

DRIVE AXLE STANDS UP UNDER SHOVEL LOADING: Dumptor is built by a shovel manufacturer for work with rock shovels. Drive axle is 4" chrome nickel steel, heat treated. Steel case protects

entire assembly. Welded steel body is heavily reinforced. Steering axle oscillates to absorb frame twisting shocks of haul road travel.

EASIEST TO MAINTAIN

Everything accessible. One man can do complete grease job in 5 minutes. Clutch removed in fraction of time it takes to remove a conventional clutch, because engine is not moved, transmission case is not touched. Every gear in transmission is removable through one cover.

YOU'LL NEED FEWER UNITS — IF THEY'RE DUMPTORS

Job studies prove 3 6-yard Dumptors can easily handle shovel output formerly requiring 4 other 6-yard hauling units. Generally, there is a saving of 20 to 25 per cent in number of units on jobs within Dumptor range of haul.

Experienced Dumptor engineers are ready to survey your off-the-highway haul problems.

Contact your Koehring Distributor today.

NO BODY HOIST TROUBLE

because Dumptor has no body hoist. Gravity tips body instantly, returns it automatically when empty.



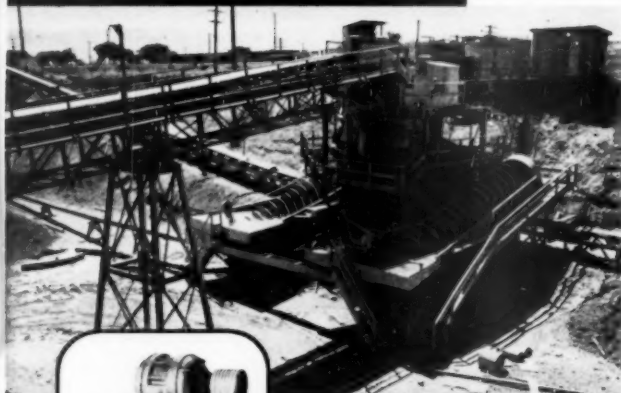
KOEHRING COMPANY, Milwaukee 10, Wisconsin
Subsidiaries: JOHNSON • KWIK-MIX • PARSONS

**GET
SPECIFICATION
SANDS
WITH**

WEMCO

SAND PREPARATION MACHINES

No. 48 WEMCO Sand
Preparation Machine.



Henry J. Kaiser Co., installation of WEMCO
Sand Preparation Machines at Radium plant.

IMMEDIATE DELIVERY
WEMCO Sand Pumps and
parts are available for
immediate shipment. For
prompt delivery call your
nearest WEMCO office.

Today's market demands **clean, dry** sands
— sands that meet exacting specifications.

WEMCO Sand Preparation Machines are
specifically designed to produce:

• **CLEANER, DRIER SANDS**

... scrubbing effect of WEMCO spiral and
dewatering action of unit remove dele-
terious matter and water.

• **SPECIFICATION SANDS**

... with maximum recovery of desired sands.
A machine to meet every need. Controls
excess fines, slime and medium fractions.

• **MAXIMUM PRODUCTION**

... exclusive WEMCO design provides
maximum sand raking and overflow capa-
cities. Automatic operation assures continu-
ous production with minimum attendance.

Reduced operating and maintenance costs
are assured — WEMCO Sand Preparation
Machines are noted for simplicity of
operation and durability of construction.

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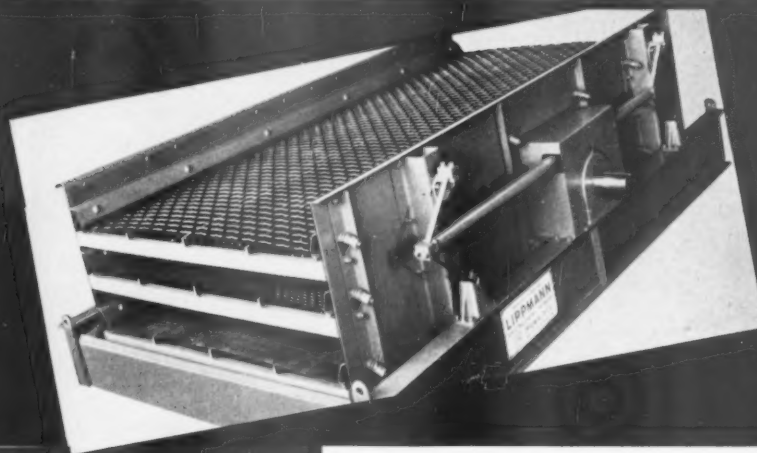
WEMCO

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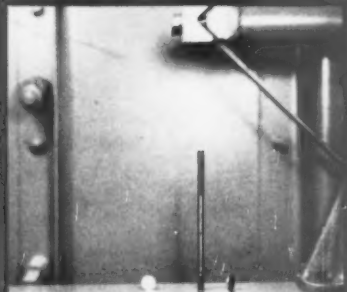
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WKE (HMS) Mobil-Mill • Coal Spiral • Standard Thickeners
(HMS) Thickeners • (HMS) Media Pumps • Hydroseparators
(HMS) Densifiers • (HMS) Separatory Cones • "SH" Classifiers
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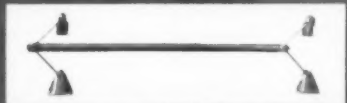
HERE'S EVERYTHING YOU WANT in a...



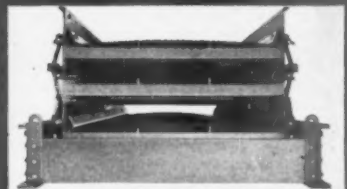
VIBRATING SCREEN!



UNRETOUCHED 1-min. time exposure proves no vibration is transmitted to frame. Straight shaft with accurately counter-weighted hubs means no unbalanced forces.



EXCLUSIVE VIBRATION EQUALIZER imparts exactly the same vibratory motion to every square inch of deck, permits increased capacity plus sharper sizing action.



LOWER HEADROOM results from advanced shaft mounting design of SCREEN-ALL. Larger hub-mounted bearings are outside body, set only $\frac{1}{8}$ in. apart.

LIPPMANN SCREEN-ALL

Gives You Higher Capacity, More Accurate Sizing

IDEAL SCREEN HAS:	LIPPMANN SCREEN-ALL GIVES IT TO YOU:
SHARPER SIZING ACTION	Perfect circle throw is possible because the entire weight of the vibrating body is carried by the shaft. True circular motion gives maximum tumbling action — every particle has more frequent contacts with cloth on all faces for highest screen efficiency.
HIGHER CAPACITIES	With a greater component of force perpendicular to screen cloth, maximum bed stratification is achieved. There's no ganging up, no blinding because positive vibration equalizer transmits identical vibratory motion to all of deck.
LOWER FIRST COST	Advanced engineering of SCREEN-ALL gives unmatched simplicity of construction. All parts are made from jigs.
LONGER LIFE	With no unbalanced forces during entire operating cycle, SCREEN-ALL gives many years of efficient performance.
LESS HEAD ROOM	Because bearings are outside screen body, shaft can be mounted close enough to deck to save up to 6 inches height.
LIGHTER SUB-STRUCTURE	LIPPMANN SCREEN-ALL transmits no vibration to supporting structure. No side or end springs, no guy cables needed.
REDUCED MAINTENANCE COSTS	Bearings are mounted only $\frac{1}{8}$ in. apart. Bending moment is sharply reduced. Hub-mounted bearings are much larger than shaft-mounted bearings on comparable screens.
GREATER FLEXIBILITY	SCREEN-ALL handles wide range of materials and sizes. Slope can be varied quickly, rotation reversed, throw changed by switching hubs, quick-change decks easily substituted.

Write for NEW BULLETIN 1200 for all the facts on
LIPPMANN SCREEN-ALL VIBRATING SCREENS

1202

LIPPMANN ENGINEERING WORKS

4603 W. MITCHELL STREET
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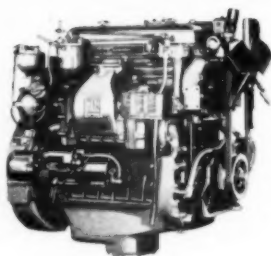


"They don't come any better."

Says Master Mechanic Ralph Stinson of Missouri Valley Construction Co.

MEN who really know—men, like Ralph Stinson, who have seen General Motors Series 71 Diesels at work—offer proof of their performance: "They hold up better and are easier to maintain than any other Diesel engine in the same horsepower range. They don't come any better," Mr. Stinson says. And he cites his records to back up his statement:

In the summer of 1946, Missouri Valley Construction Co. replaced three 3-ton dump trucks with a pair of Koehring Dumpers, powered by GM 4-71 Diesels. Since then, the two units, now quarrying limestone at Warren, Mont., have tripled production with lower fuel costs. Maintenance has been considerably lower too,



Mr. Stinson reports.

General Motors Series 71 Diesel engines are designed to produce more power at lower cost. Their sturdy two-cycle operation delivers power at every piston downstroke—smooth, dependable power that responds instantly to varying load demands. They're sensible in size and weight, and compact construction makes them easy to install.

Simplified design makes service and maintenance much easier.

All these features combine to make your operation easier and more profitable. It will pay you to investigate the possibilities. Get the complete story from your nearest distributor or write to us.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... Up to 200 H.P.

DETROIT 25, MICHIGAN

MULTIPLE UNITS... Up to 800 H.P.

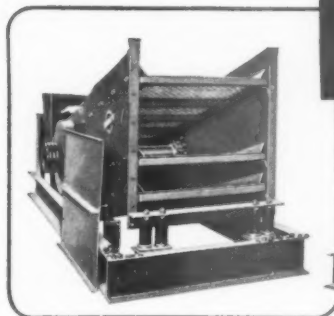
GENERAL MOTORS



DIESEL BRAVN WITHOUT THE BULK

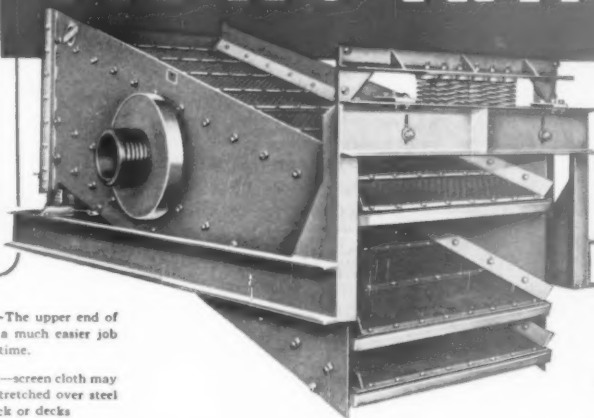
trouble-free screening

with the TELSMITH VIBRO-KING



Changing Screen Cloth Is Simple and Quick—The upper end of the Vibro-King is readily removable, making it a much easier job to change screen cloth and saving a great deal of time.

Screen Cloth Mounting—At customer's option—screen cloth may be mounted in rubber on steel screen trays; or stretched over steel screen supports protected by rubber—on any deck or decks



● Simpler in design and more efficient, with lower upkeep—the TelSmith Vibro-King has only two bearings instead of the usual four. The vibrating unit is mounted on these two well protected, heavy-duty roller bearings. The TelSmith-patented automatic counterweights assure smooth starting and stopping as well as exceptionally smooth operation. The circular screening movement is uniform everywhere on the screen cloth, and is constant under any load.

Entire vibrating mechanism, including vibrating unit and screen cloth, floats on nests of springs. Adjustment to the right screening angle is quick and easy. It's an efficient and rugged screen at a reasonable price. The welded and reinforced main frame is *horizontal*—for rigidity, and easier installation. Cable suspension if desired. The TelSmith Vibro-King Screen is made in several sizes with 1, 2 or 3 decks. Send for Bulletin V-11.

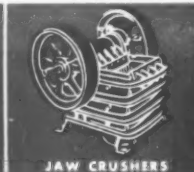
V-28

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

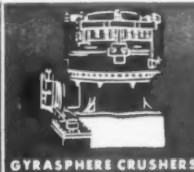
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GYRATORY BREAKERS



JAW CRUSHERS



GYRASPHERE CRUSHERS



APRON FEEDERS



SUPER SCRUBBERS

**This Simple Test
Shows Exactly How**



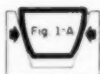
The **CONCAVE SIDE** (U.S. Patent No. 1813698) **Saves You Money!**

Pick up *any* V-belt having the ordinary straight sides and *bend* the belt. Three things will happen, right before your eyes.

(1) The top of the belt is under tension and grows *narrower*. (2) The body, under compression, becomes *wider*. (3) The sides of the belt *bulge out*. (Figures 1 and 1-A, below.)



Straight Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove

This bulging of the straight-sided V-belt in its sheave-groove costs you money in *two* ways—(1) The bulge causes uneven sidewall wear—*shorter life!* (2) The bulging side cannot evenly grip the wall of the sheave groove—a loss in *transmission efficiency!*

In figures 2 and 2-A, you see how the precisely engineered *concave* side of the Gates Vulco Rope exactly corrects this bulging.



Gates Vulco Rope with Concave Side.



No Side Bulge. Precise Fit in Sheave-Groove.

Two distinct *savings* result. (1) The Gates Vulco Rope wears evenly—*longer life!* (2) The entire side-wall grips the pulley—carries heavier loads and *sudden load increases* without slippage—*saves belts* and also *saves power!*



The Mark of **SPECIALIZED** Research

**The Concave Side is
MORE IMPORTANT NOW
Than Ever Before**

Because the sides of a V-Belt are what actually drive the pulley, it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley directly through the belt's sidewalls.

Now that Gates **SPECIALIZED** Research has made available to you **SUPER Vulco Ropes**—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side is naturally more important in conserving belt life today than ever before.

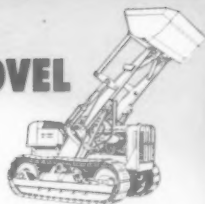
498

GATES VULCO DRIVES
Engineering Offices and Jobber Stocks
ROPE IN ALL INDUSTRIAL CENTERS
of the U. S. and 71 Foreign Countries

THE GATES RUBBER COMPANY
DENVER, U.S.A.
The World's Largest Makers of V-Belts

Now!

**BUILDER OF FAMOUS TRACTO-SHOVEL
ANNOUNCES**



two new

HYDRAULICALLY OPERATED

TRACTOLOADERS

for all kinds of material handling

model TL-B

- Standard bucket: 10 Cu. Feet
- Weight 5,250 lbs.
- Major tractor components — Allis-Chalmers
- Brake Hp. 27.8
- Max. clearance under bucket hinge, 6' 2"
- NOTE—Interchangeable buckets and other accessories



**MORE PRODUCTION WITH
LESS OPERATOR EFFORT**

FULL LOAD IN BUCKET MAKES STEERING EASIER

—NOT HARDER Tracto-Loader design — bucket over driving wheels, steering wheels in rear — gives you better traction, easier steering. Saves bogging down — saves dumping part of load to get out of soft going.

GETS BIG LOADS IN SMALL WORKING AREAS Eases into material — no ramming. Forward crowding action and automatic "tilt-back" of bucket mean fast, easy loading . . . bigger loads, in closest quarters!

HYDRAULIC BUCKET CONTROL Fast-acting, positively controlled bucket can be dumped in part or all at once at any height to maximum. Dumps clean — sticky material shakes loose.

FULL VISION Unobstructed operator vision . . . handy controls, comfortable seat.

HIGHEST QUALITY MATERIALS THROUGHOUT for long, dependable service. Hydraulic system has leak-proof, seamless steel tubing and hose lines with "Instant Fix" detachable and re-usable fittings — no waiting for parts.



model TL-W

- Standard bucket: 1 1/2 Cubic Yard
- Weight 8,000 lbs.
- Major tractor components — Allis-Chalmers
- Brake Hp. — 38.45
- Max. clearance under bucket hinge, 8' 8"
- NOTE—Interchangeable buckets and other accessories

get all the facts...send coupon for more information

TRACTOMOTIVE

Tractomotive Corporation Now in our new plant at Deerfield, Illinois

**NATION-WIDE
SALES AND SERVICE**

**SOLD AND SERVICED EXCLUSIVE-
LY THROUGH ALLIS-CHALMERS
INDUSTRIAL TRACTOR DEALERS**

TRACTOMOTIVE CORPORATION • Deerfield, Illinois

Please send more information on Tracto-Loader: Model TL-W _____, Model TL-B _____

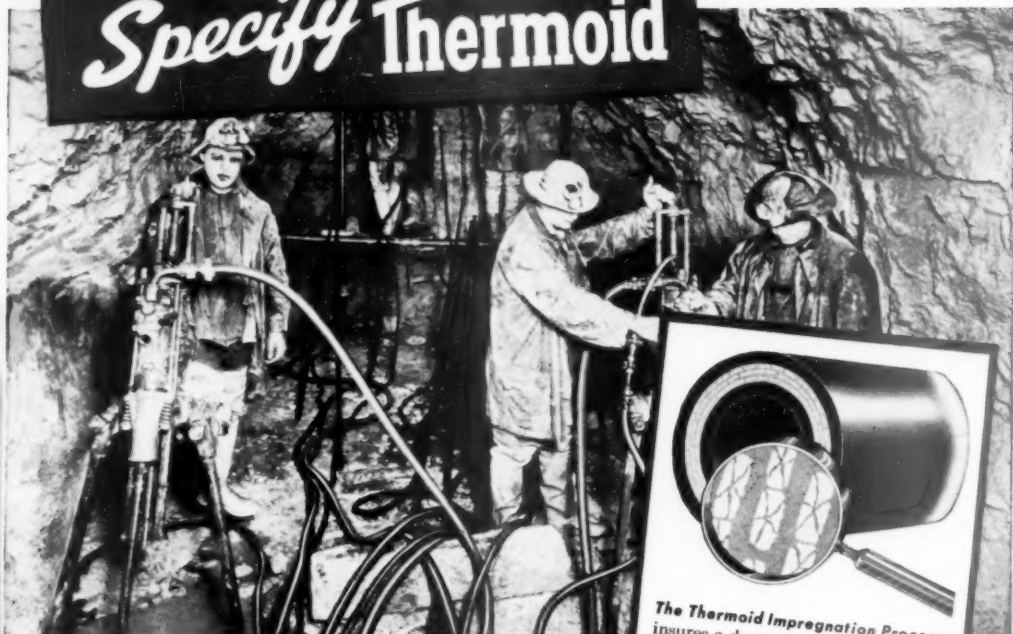
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Specify Thermoid



New Air Hose For Mine Service

From Thermoid's planned program of product development and improvement—a new air hose for mine use. Specifically designed for this exacting requirement—field proven in actual operation—it offers the maximum in trouble-free service. Heavy synthetic rubber oil-proof tube—rayon cord reinforcement for greatest strength and flexibility—smooth extra heavy rubber cover for maximum resistance to abrasion and cutting from sharp rocks.

Mandrel-built to assure uniform inside diameters. All sizes from $\frac{1}{4}$ " to $1\frac{1}{2}$ " inclusive in 50' lengths. Available from your nearest Thermoid distributor or if you prefer write us for additional information.

It will pay you to *Specify* Thermoid!

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.



The Thermoid Impregnation Process insures a deeper penetration of rubber between the threads of the yarn, which encases each individual strand with protective rubber. The rubber acts as a sheath between the strands and prevents the destructive abrasive action as the product is flexed in use. To obtain the required rubber penetration, the twist of the yarn must be to exact specifications. With the yarn twisted too tightly, proper penetration of the rubber compound is impossible. This condition produces abrasion, causing premature failure. On the other hand, if the yarn is twisted too loosely, the product lacks tensile strength. Thermoid has discovered the optimum twist of the yarn which assures maximum rubber penetration and greatest strength. The development of Thermoid Impregnation Process is another step forward in Thermoid's planned program of product improvement, assuring maximum service and lower operating costs to industry through the use of Thermoid Industrial Rubber Products.

Thermoid
Company

Main Offices and Factory • Trenton, N. J., U. S. A.
Western Offices and Factory • Nephi, Utah, U. S. A.
Industrial Rubber Products • Friction Materials • Oil Field Products

"50"



"81"



"101"



TWIN-UNIT



PORTABLE GRAVEL PLANTS

For Every Need

Whatever your production requirement may be — there's an Austin-Western Portable Crushing and Screening Plant to meet it. From the smallest single-unit plants to the magnificent two- and three-unit combinations every Austin-Western Portable Plant is correctly balanced from feed to delivery conveyor, equipped with high-capacity crushers, and engineered for maximum output at the lowest cost per ton. No matter what size or quantity you want—there's an Austin-Western plant "tailored" to fit your needs—designed to do your particular job with speed and efficiency.

"50" The "50" Plant illustrated is one of the many smaller sizes of Austin-Western Portable Plants. Bins, Crushers, Screens, Elevators and Conveyors are available in a wide variety of sizes and may be easily combined to meet any individual production problem.

"81" A 1036 Roller Bearing Jaw Crusher, combined with perfectly matched screens and conveyors, make the compact, efficient "81" the ideal plant for many installations. It's engineered from end to end for continuous "low-cost tonnage."

"101" The unrivalled production of the "101" is due to its high-speed Jaw and Roll Crushers, and its completely "balanced" design which provides unusually wide conveyors and extra-large positive-throw type vibrating screen.

TWIN-UNIT Multiple-Unit Plants combine light transport weight, and great flexibility in operation, with the capacity necessary for tremendous production of material. Several sizes can be produced at one time.

AUSTIN-WESTERN COMPANY
AURORA, ILLINOIS, U.S.A.

BUILDERS OF ROAD MACHINERY
Austin Western
SINCE 1894





SMOOTH-PERFORMING CP COMPRESSORS

cut operating costs

On these CP-500 Diesel-driven Portable Air Compressors, six-cylinder Caterpillar D-13000 engines . . . and the V-8 arrangement of compressor cylinders . . . promote smooth, economical performance.

The gradual speed regulator adapts engine speed to air demands, holding fuel consumption to a minimum so that CP Compressors operate at partial

loads even more economically than at full loads. This CP feature also minimizes wear and tear, keeping down maintenance costs.

CP Portable Air Compressors are available in gasoline-driven models of 60, 105, 160, 210 and 315 c.f.m., actual capacity, and in Diesel-driven models of 105, 160, 210, 315 and 500 c.f.m.

Write for detailed information.



**CHICAGO PNEUMATIC
TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



THIS MODERN CONVEYOR SYSTEM IS— **A WILLING SLAVE—To A Rock Pile**

In this modern California rock plant, Stephens-Adamson conveying equipment, controlled from one central station, is a "Willing Slave" . . . moving 300 to 400 tons of rock per hour.

Long experience with rock handling problems enables Stephens-Adamson conveying engineers to recommend and furnish the right equipment and best arrangement for low-cost handling under any given set of conditions.

In your initial planning for a new unit or a completely new bulk materials handling system—first get the recommendations from this experienced staff of S-A engineers. Write today.

KERN ROCK COMPANY
BAKERSFIELD, CALIF.

Centralized control of all conveying equipment by one man, at ground level, is an outstanding feature of this modern rock handling installation, designed and built by S-A engineers. Several grades of crushed rock, gravel and sand are handled from receiving hopper through crushing and screening to storage bins. Belt conveyors, screens and pan feeders comprise the major conveying equipment furnished her- by S-A.

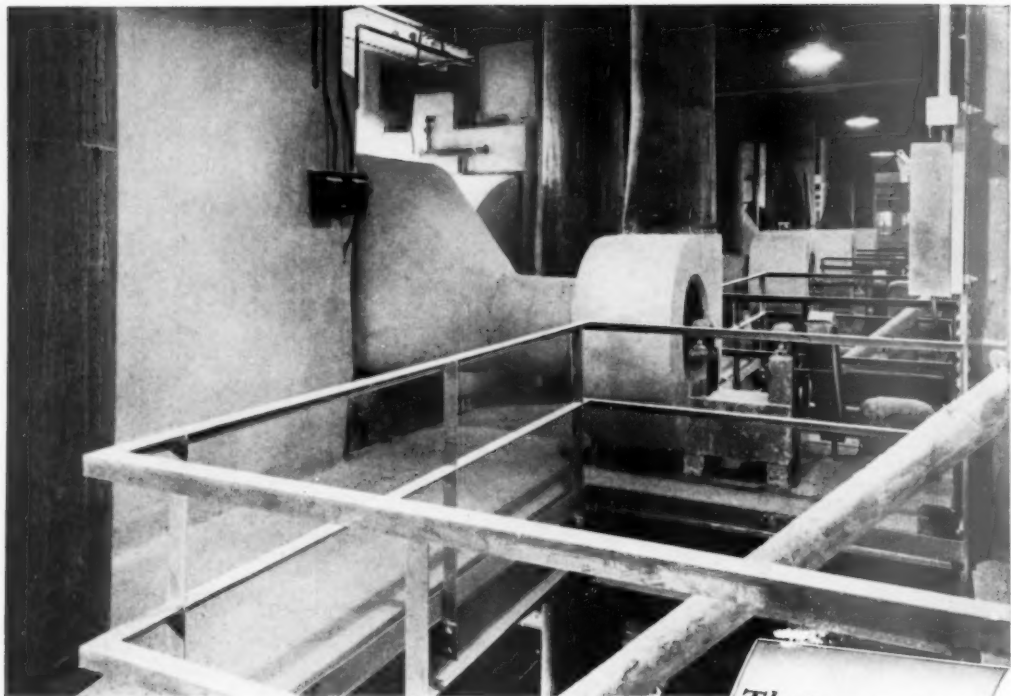
STEPHENS-S-ADAMSON

7 Ridgeway Avenue, Aurora, Illinois MFG. CO. Los Angeles, Calif. • Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

ROCK PRODUCTS. June, 1949

29



KOPPERS-ELEX PRECIPITATOR RECOVERS MORE GYPSUM THAN GUARANTEED!

The Story Behind
KOPPERS-ELEX
Performance
GUARANTEE

A LARGE gypsum plant, faced with the problem of controlling the disadvantage of gypsum dust, chose a Koppers-Elex Precipitator. Outstanding performance in excess of guaranteed results was obtained.

Under standard (A.S.M.E.) tests conducted during actual operating conditions, the precipitators on four calcining kettles limited re-

siduals to .07 grain per cubic foot of gas—and the overall efficiency on the precipitators installed on the rock drier averaged 99.30%.

This performance, which exceeds the guarantee, is typical of Koppers-Elex operation. Correct design and precision engineering, coupled with the experience gained from over 1000 successful installations, give superior results in the

recovery or removal of materials from gases. For the same superior performance in your plant, specify Koppers-Elex — designed, engineered, built, installed and guaranteed by Koppers...with 111 years of reputation-building integrity behind it. Koppers Co., Inc., Koppers-Elex Precipitator Department, 246 Scott St., Baltimore 3, Maryland.

**1st with Industrial Gas
Cleaning Equipment**

Koppers-Elex 

ELECTROSTATIC PRECIPITATOR



Tamer of Vicious Digging Jobs



Work that breaks down ordinary dragline buckets is just another job to ESCO's heavy duty dragline buckets.

For example, in the scene above an ESCO dragline bucket is shown in the process of digging up acres of compacted steel slag, much of which is under water. Pieces of slag averaged over three feet in diameter.

Buckets of three other makes quickly broke down on the job, but an ESCO heavy duty dragline bucket was still going strong after six months of this work.

Here are the reasons for the rugged performance of ESCO buckets:

Parts subject to shock and wear are cast of ESCO Manganese Steel, get harder and tougher with use.

Hollow cast arch for greater strength.

Extra strong where strength is needed.

No unnecessary bulk.

For less strenuous service, ESCO Medium and Standard dragline buckets are recommended. All three types feature clean cutting lip for positive bite, balance for smooth carrying, control for accurate spotting, and design for quick dumping.

Ask for Descriptive Catalogs

For detailed information about ESCO dragline buckets, ask your nearest ESCO representative for catalogs, or use the coupon. Electric Steel Foundry, 2177 N.W. 25th Avenue, Portland 10, Oregon; 726 Porter Street, Danville, Illinois. Offices in Eugene, Oregon; Chicago; Honolulu; Houston; Los Angeles; New York City; San Francisco; Seattle; Spokane. In Canada, ESCO Limited, Vancouver, B.C.

ESCO

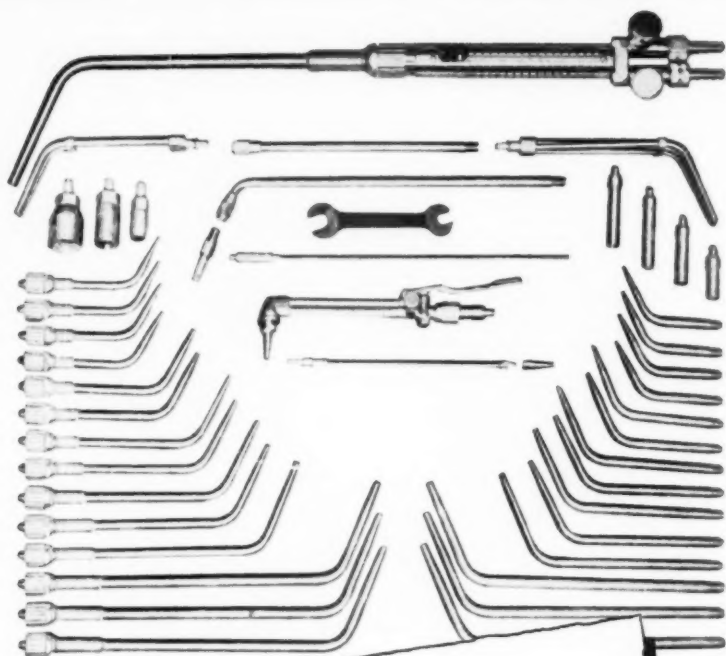
DRAGLINE AND DIPPER BUCKETS

ELECTRIC STEEL FOUNDRY
 2177 N.W. 25th Ave., Portland 10, Oregon
 Please send catalogs on ☐ Heavy Duty dragline; ☐ Medium type;
☐ Standard type. Size _____ yards.

Name _____

Address _____ Zone _____

City _____ State _____



Here is Airco's **New** Torch for
Heavy Duty welding...
 heating... brazing

The new Airco 800 Torch is designed for tough, *heavy-duty* jobs. As shown in the illustration, the torch operates with a complete range of welding tips (with or without individual mixers) as well as heating, brazing and a variety of tips for other uses. No other torch can offer this wide operating range.

The torch head is of durable, long-wearing monel metal; thus fewer torch head replacements, and lower maintenance costs result. The general design of the new Airco 800, plus flexible 1/4" or 5/16" I.D. hose, assures perfect balance and ease of manipulation... lowered operator fatigue.



With the addition of a cutting attachment, the Airco 800 is easily converted to handle general shop cutting work.

If you would like more information about this torch, or a **FREE** demonstration right in your own shop, address Dept. MF-8471, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.



AIR REDUCTION

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

★★★★ Barber-Greene ★★★★★

B-G COST SAVING BULLETIN No. 4901

63,000 TONS UNLOADED IN 210 DAYS FOR READY-MIX PLANT

"Not an Hour or a Penny for Repairs"

Griffith, Ind.—The Griffith Ready-Mix Company have speeded up and greatly simplified hopper-car unloading operations at their plant here—as shown by their record of unloading over 1,000 cars in 210 days. Their B-G Belt Car Unloader and Portable Conveyor are unloading 5 to 6 cars a day on a 6-day week basis.

Griffith's unloading setup is simple, low in cost and effective. They keep about 60 cars of aggregate on hand, and their 358 Unloader is easily placed over the rails (it works equally well in pits), and, with the 363 Portable Conveyor unloads to a temporary stock pile at a 3-ton-per-minute clip.

Previously, a crane was used for unloading and stockpiling operations. Now it is free for a variety of other tasks around the yard.

Griffith's operators have found that the 358 won't jam up and will start with a full load on the belt. The 363 Conveyor is equally sturdy, capable of operating 24 hours a day—day in and day out—on a 3-ton-per-minute basis.

One Man Unloads 50-Ton Car in Hour to Radial Storage

Richmond, Va.—One-man unloading to radial storage bins has meant real economy to Tiller Coal Company, Inc. The B-G Coal Unloader and Radial Conveyor provide the flexibility required to unload directly into bins or trucks as the occasion demands. "We have found we can exceed everything Barber-Greene said the setup would do," said L. W. Gress, president of the concern.



The Model 358 Car Unloader and 363 Conveyor combine higher standards of performance, higher capacities and more ability to handle all materials than heretofore available in any other loader-conveyor combination.

EFFICIENT CONVEYOR PLAN SAVES 90% OF EQUIPMENT COSTS ON \$2½ MILLION BRIDGE JOB

Jacksonville, Fla.—The George D. Auchter Company of this city credits much of the savings that made possible its being the low bidder on a 2½ million dollar bridge contract to its new B-G 363 Conveyor and 358 Unloader.

This job, 30 miles from the city, offered no railroad facilities so it was necessary to barge materials to the site. Loading the barges from hopper cars was a real problem. First consideration was given to equipment that would cost over ten times that of the B-G unloading team until they learned how easily the 358 Unloader and 363 Conveyor could do the job.

All Materials Handled by B-G Team

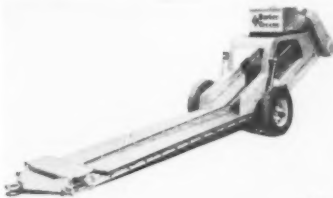
The result was that the 358 and 363 unloaded all the materials from cars on the Auchter Company's spur at the riverside. Material was sent directly into the barges through a chute at the discharge end of the 363 Conveyor. This, the company reports, was a high volume, low cost and entirely successful operation which was largely responsible for its being able to secure the contract.

Auchter Company is using the same unloading setup to barge materials for a power plant project located on the river. Mr. Auchter points out that due to the low cost of loading the barges, it is much more economical for his company to supply material to the job site in this manner than to go to the expense of building a railroad spur into the project.



Ship Carries Own Unloaders

Mobile, Ala. The good ship *Rosario* operated by the Suwannee Steamship Company carries two B-G 363 Portable Conveyors to facilitate loading and unloading cargoes of bulk materials such as sulphur, gypsum, etc. Low initial cost and high capacity of the B-G units account for their seafaring role.



Frees Crane for Other Work

New Enterprise, Pa. A 358 Hopper Car Unloader fitted in neatly with the needs of the New Enterprise Stone & Lime Company. It was purchased for unloading cinders from hopper bottom cars, thereby releasing an expensive crane which had been tied up on this uneconomical service. This highly portable Unloader is also being used to unload coal at one of their large storage yards near Bellwood at the rate of one 70-ton car every 55 minutes.

PORTABLE CONVEYOR UNLOADS 18,350 BARRELS OF BULK CEMENT

4 to 5 Cars per Day

NEGLECTIBLE CEMENT LOSS



SAVES \$30,000 ON TRUCK MIXERS BY USING PORTABLE CONVEYORS

Bellefonte, Ill.—A skillful combination of a B-G 363 Conveyor with a team of dry batch trucks has enabled the Hoeffken Brothers to maintain a fast-moving, ready-mix concrete business with a minimum of investment.

Hoeffken Brothers operate two ready-mix trucks. These trucks are supplied by six dry batch trucks and their B-G Conveyor. The dry batch trucks are used to enable the more costly ready-mix trucks to cut their haul down to a minimum, thereby increasing their daily capacity to the extent where additional ready-mix trucks are not required.

For one paving job located 15 miles from the Hoeffken Brothers batch plant,

materials were delivered to the ready-mix trucks $\frac{1}{2}$ mile from the job by the dry batch trucks. The company reports when the haul exceeded this $\frac{1}{2}$ -mile figure, they hooked the 363 Conveyor to the water truck and trailed it down the road to another more desirable location. The Conveyor used is 35' long with a corrugated sheet metal cover and a large hopper at the charging end. Batch trucks dump a 4-yard dry batch of concrete into the conveyor hopper and in less than 2 minutes a 4-yard ready-mix truck is ready to go. Hoeffken Brothers figure that they have saved in the neighborhood of \$30,000 in over-all investment in production equipment.



Foundry Cuts Coke Unloading Costs 76%

Rockford, Ill.—New, modern unloading equipment has enabled the Greenlee Bros. & Co. foundry to cut costs for unloading a car of coke from \$20.00 to \$4.80 per car. This substantial saving is accredited to the performance of their 363 Portable Conveyor and 358 Car Unloader—which are quickly paying for themselves in this 100-car-a-year operation.

Additional savings are reported by Greenlee Bros. through the reduction of demurrage charges due to the ability of this unloading-stockpiling "team" to get to work fast and operate steadily at maximum capacity.

Their all-material B-G Unloader and Conveyor are also used to unload flux-stone and foundry sand.



Unloader-Loader Team Does Many Jobs for Cement Plant

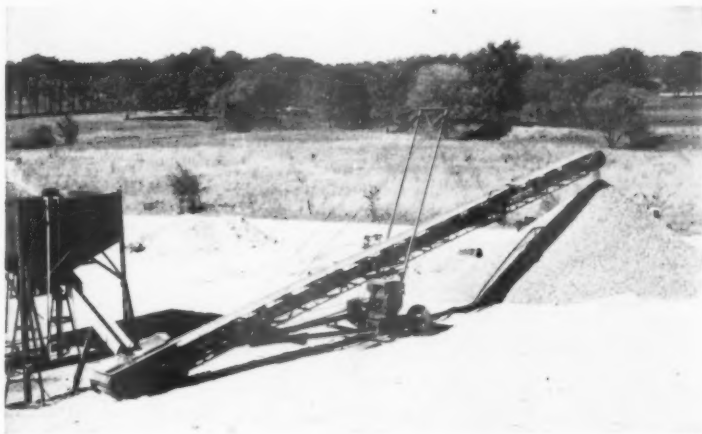
Charleston, S. C.—Production equipment has to be kept working to pay off to the best advantage and it is on this basis that the Carolina Giant Cement Company keeps its B-G 363 Conveyor and 358 Car Unloader busy as general utility equipment on a variety of jobs all over the plant. First, they are frequently at work stockpiling coal from hopper cars along the company's rail siding. Later, the 363 is used in loading the coal from the stock pile for use in the plant.

Gypsum is brought to the plant in box cars and here the 363 is fed by hand to transfer the gypsum from the box cars to a bucket elevator which carries the material up to silos.

Recently when the plant was being altered, it was necessary to drive piling and build foundations inside of the buildings. When this was done, the 363 was used to transfer dirt through a window to the inside of the building for backfilling around the foundation.

Well pleased with the general usefulness of these production tools, Mr. F. M. Murray, shop superintendent, further adds that at times the 358 Unloader has to operate under the most adverse conditions—often the lower half is in water underneath the rails. As in so many other tough jobs, the 358 gives high capacity, dependable performance even under these unsatisfactory conditions.

"A BEAUTIFUL RIG ON OUR SEWAGE PLANT JOB" says B-G OWNER



Heavy Duty Conveyor Runs Up Total of 80,000 Tons of Stone Handled Spans Canal in Loading Trucks from Railroad Cars

Worcester, Mass.—80,000 tons of $3\frac{1}{4}$ " crushed stone for this city's new sewage treatment plant were loaded to trucks at a 1000 ton per day rate by a B-G Heavy-Duty Conveyor owned by the V. Barletta Company.

Loading up to 1000 tons per day, the 24" x 60' conveyor spanned a 15-foot canal between trucks and the railroad cars. Mr. Barletta reported that this daily capacity was limited only by the ability of the railroad to supply cars, and could have been much higher if they had been available.

Further, Mr. Barletta states, "This conveyor is a beautiful rig. There is absolutely no comparison with any other method of unloading bulk material from cars to truck or storage."

Barletta's B-G Conveyor has been widely useful in the years since it was purchased. A standard Heavy-Duty Conveyor, it is portable, equipped with full-swiveling wheels for radial stockpiling—one of the full line of B-G Portable Conveyors available in belt width of 18", 24", 30" and 36" in lengths up to 150'—capacities to 400 t.p.h.

Half Million Yards of Stone Moved with Practically No Maintenance

Montgomery, Ill.—Nineteen years ago the Fox Valley Gravel Co. bought a Heavy-Duty Portable B-G Conveyor and put it to work in their quarry. At that time, it was an 18" x 30' Conveyor. Today it is an 18" x 60' Conveyor with a total of 500,000 yards of crushed stone to its credit.

H. C. Leppert states it's an impressive record and backs his opinion with a cost sheet that shows the replacement of only one belt carrier in nineteen years.

This conveyor is equipped with all-welded, plain-bearing belt carriers that are noted for rugged endurance. Typical of all B-G "Portables," it is built up of Standardized Sections and is easily shortened or lengthened as in the case here, where it was lengthened to 60' when the need arose.

County Stockpiles 70,000 Yards with Zero Dollars Spent for Repairs

Geneva, Ill.—The Kane County Highway Department furnishes added evidence of the usefulness and low operating expense of B-G Heavy-Duty Portable Conveyors in a recent report. The conveyor has seen constant service during the winters since 1944—stockpiling 70,000 yards of crushed stone for use in summer highway work—and they have yet to spend a penny for replacement of any part. An 18" by 60' unit, their B-G Conveyor helps materially in promoting low cost highway maintenance.

Have you seen the B-G City?

Here is a novel and interesting color illustration of the imaginary Barber-Greene City, showing almost countless operations in material handling, ditching and bituminous construction.

Write for your free copy.

Peach Pits by the Yard Via Versatile Portable Conveyor

Los Angeles, Cal.—Peach pits, walnut shells, apricot pits and the like are not allowed to go to waste by progressive food industry operators such as the Agrashell Corporation, producers of insecticides, resins and oils. And companies such as this are turning to the B-G Model 363 Portable Conveyor as an ideal means to handle this exotic bulk material in large quantities on a steady, day-in and day-out basis. Here the material is brought to the plant in side-dump gondola cars and fed through a portable hopper to the receiving hopper of the B-G Conveyor. The 363 transports material into the plant for further processing.



THE  LINE CUTS COSTS ALL ALONG THE LINE...

See Barber-Greene for:



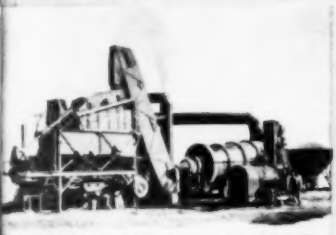
B-G BUCKET LOADERS: Crawler or pneumatic-tire mounted. For low cost truck loading of bulk materials. Capacities up to 3 cu. yd. per min.



B-G DITCHERS: Crawler and pneumatic tire mounted, for digging trenches from 5 1/2" wide, 4' deep to 24" wide, 8' 3" deep.



B-G PERMANENT CONVEYORS: Complete, standardized equipment including carriers, take-ups, drives, frames, etc.



B-G BITUMINOUS PLANTS: Highly portable plants for producing all types of mixes—up to 120 T.P.H.



B-G FINISHERS: Automatically place smooth level surface regardless of variations in subgrade.



B-G COAL YARD EQUIPMENT: Belt and chain-and-flight Portable Conveyors; self-propelled, pneumatic-tired. Also, hopper-car Unloaders.

Use Barber-Greene's 30 Years of Experience to Help You Plan Your Job. It can be Valuable and is at Your Service

It always pays to eliminate guess work. Barber-Greene offers you the benefit of over thirty years experience in designing and building equipment proved year after year on jobs—and in industries—like yours. Barber-Greene's Representatives are material han-

dling specialists with practical experience in successfully applying the right machine to jobs like yours. Consult your Barber-Greene Distributors, or write directly to Aurora, Illinois, for information you need to do your job most profitably.

Barber-Greene Company
Aurora, Illinois
Cable address "Bargreene"

Send information on the Barber-Greene's checked below as indicated:

- ☐ 363 Conveyor
☐ 358 Unloader
☐ Heavy-Duty Conveyor of _____ belt width,
_____ length and or
_____ capacity

- ☐ _____
Other B-G Equipment
☐ Have a Representative Call

Name _____

Company _____

Position _____

City _____ Zone _____ State _____

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Before You Buy . . .

Send This Coupon!

The coupon will bring you complete information on any Barber-Greene machine without cost or obligation.

We will be glad to have our representative call to discuss your material handling problems with you.

We maintain a Department for the sole purpose of solving your material handling problems.

BARBER-GREENE COMPANY
Aurora, Illinois



It's scoop and load
scoop and load
scoop and load

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You keep a fast-moving procession of trucks under your shovels when you blast with Primacord. Because Primacord works to produce the kind of well-broken ground that makes digging much easier.

Then - - - costs go down

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RIMACORD

Primacord is flexible, easy to handle and hook up with square knots and half hitches. Down-hole lines contact every cartridge; when a shot is fired the entire charge from top to bottom initiates with peak explosive power. Trunk lines can be laid out so that front holes fire a split-second before succeeding ones; this gives you relief of burden that adds a whopping jolt to fragmentation.

A non-conductor, Primacord is insensitive to stray currents, comes wound on light-weight spools in three different grades. Ask your explosives supplier which you should use . . . or write us direct.

THE ENSIGN-BICKFORD CO. • Simsbury, Conn.

PRIMACORD-BICKFORD **Detonating**
• Fuse •



Can you Answer these Questions about **HAMMERMILLS?**

Q. What are some of the important differences in various makes of hammermills?

A. First and foremost is the degree of resistance to clogging when the material has high moisture content. Other differences involve: drying costs, capacity, power consumption, range of reduction, etc. All are important in terms of greater production at less cost.

Q. What single difficulty is the one most often encountered in crushing operations?

A. "Traffic jams" frequently result through inability of the average hammermill of conventional design to resist clogging in the handling of wet, clayey, sticky material.

Q. Has this difficulty been successfully overcome?

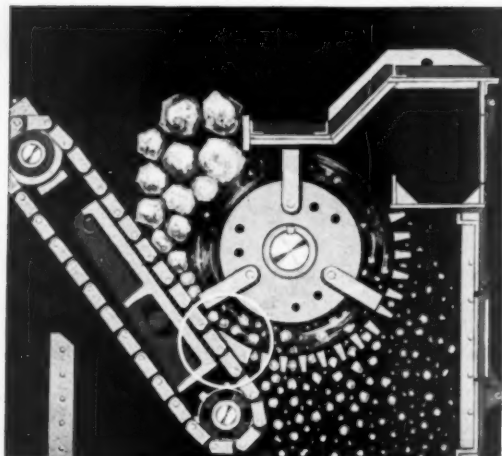
A. Yes . . . by the development on the part of Dixie engineers of a vastly improved crushing principle known as the Dixie Continuously Moving Breaker Plate.

Q. Is the Dixie Continuously Moving Breaker Plate an exclusive Dixie feature?

A. Yes . . . covered by U. S. Patents Granted and Pending.

Right! The Dixie Non-clog Continuously Moving Breaker Plate is the distinguishing characteristic of the famous Dixie Hammermill. Its time and money-saving features have practically revolutionized the reduction of raw materials in hundreds of installations all over the world. This singular record of accomplishment, proved in actual case histories, is your positive assurance that you can do it better with a Dixie.

Remember . . . there's only one Dixie. Don't be satisfied with anything less. For details request a copy of our helpful, informative bulletin, "More Efficient Crushing of Raw Materials."



DIXIE

**MACHINERY
MANUFACTURING CO.**

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St. Louis 20, Mo.

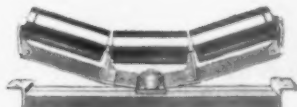
104 Pearl St.
New York, N. Y.



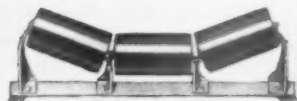
You'll get
Big Returns
from this return idler!



Rex Style No. 35 Impact Cushioning Idler . . . dual purpose rubber rolls cushion shocks at loading points . . . minimize belt rupture and lacerations.



Rex No. 33 Self-Aligning Troughing Idler . . . used at intervals to align belt where off-center loading, side-wind drifting and uneven stretch are problems.



Rex No. 32 Troughing Idler . . . is roller-bearing equipped, can be furnished with steel or gray iron rolls. Has no shelves or pockets to catch dust . . . is self-cleaning.



Rex No. T-6 Flat Belt and No. T-1 Return Idlers . . . are dead shaft type idlers. They are equipped for high pressure grease lubrication . . . have hydraulic type fittings.

AN INVESTMENT in Rex Rubber-Covered Spiral Return Idlers will return big dividends in longer idler life, fewer conveyor breakdowns with less lost production time.

Why?

Because this patented return idler provides an ever-changing point of contact between the belt and idler. Ice, abrasive, corrosive and sticky material cannot build up on the idler and cause premature wear and operating difficulties. And the rubber-to-rubber contact between idler and belt reduces wear on the idler to the minimum.

Rex Rubber-Covered Spiral Return Idlers are made of flat-bar steel helical spirals covered with rubber. The spiral is mounted on a standard Rex Unit Roller Bearing Assembly Tube . . . the famous tube design that leads the idler field in long-life service. Spiral has left and right-hand sections to insure centering of the belt.

Install a few of these cost-cutting return idlers immediately following the head pulley of your conveyors and watch the returns you get in smooth, trouble-free service. A Rex Idler Specialist will be glad to give you the complete story. Or if you prefer, send for Bulletin No. 463. Address Chain Belt Company, 1649 West Bruce Street, Milwaukee 4, Wis.





Reflections of a busy life

If a Bucyrus-Erie could write its memoirs, that would be an apt title . . . for Bucyrus-Eries, like this $\frac{1}{2}$ -yd. 15-B dragline, have a reputation for staying on the job and delivering profitable output through years of service.

Part of the long life of Bucyrus-Eries is due to superior design that meets destructive

stresses with ample strength. Part of it comes from easy maintenance and accessible deck machinery that licks serious trouble before it starts. Part of it is due to top quality materials and workmanship — the best obtainable.

Add up these features and you'll see why so many leading contractors believe in being Bucyrus-Erie-equipped!

**BUCYRUS
ERIE**

**The BEST buy Bucyrus,
the best BUY in excavators**

Bucyrus-Erie Company
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When It's
Grinding or Pulverizing

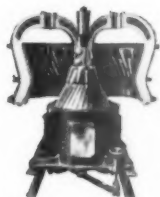
STURTEVANT
EQUIPMENT

*DOES THE
JOB FAST!*

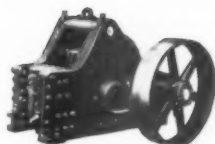
Whether you grind soft or hard materials, there is a Sturtevant Grinder or crusher exactly suited to your requirements.

Tough and rugged, Sturtevant Equipment has the built-in stamina to stand up under continuous operation. Most of this equipment has the "open door" accessibility which makes cleaning easy.

Look into Sturtevant Grinders and crushers for your applications. These machines will give you the exact mesh you want . . . cut your costs by increasing production. Write for catalog today.



ROTARY FINE CRUSHERS for intermediate and fine reduction (down to $\frac{1}{8}$ "). Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers.



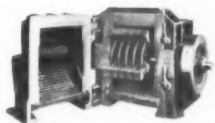
JAW CRUSHERS for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.



RING-ROLL MILLS for medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operated in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.



CRUSHING ROLLS for granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8 x 5 to 36 x 20. The standard for abrasives.



SWING-SLEDGE MILLS for coarse and medium reduction (down to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

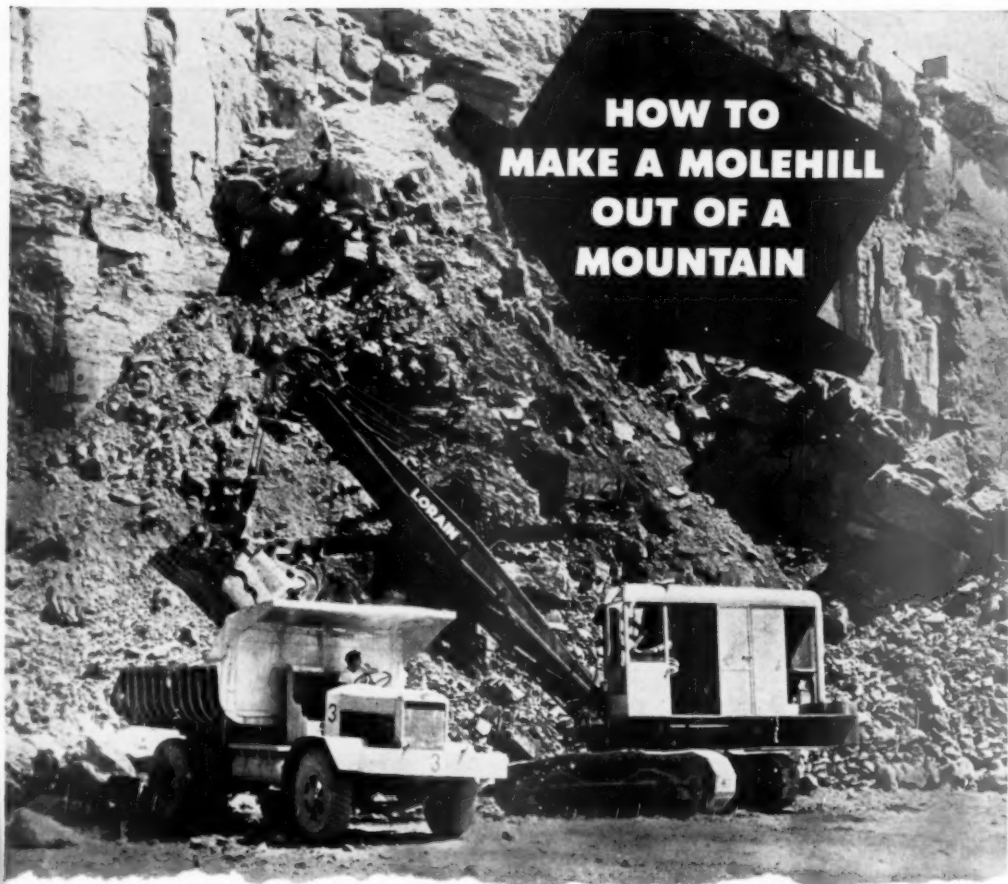


MOTO-VIBRO SCREENS screen anything screenable. Classified vibrations. Unit construction—any capacity. Open door accessibility. Open and closed models with or without feeders. Many types and sizes—range of work $\frac{1}{2}$ " to 60 mesh.

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HOW TO MAKE A MOLEHILL OUT OF A MOUNTAIN

SCHOHARIE STONE CORP., SCHENECTADY, N. Y., might aptly be referred to as "massagists for a stone face". And though the company owns 5 Lorains, it uses only one Lorain-80 to average 1500 tons of rock per 9-hour day, working against the 110 ft. limestone face, shown above.

This is just one of hundreds of examples where Lorain shovels deliver top performance on all-rock jobs. For sheer brute power, rugged dependability, and built-in stamina are part and parcel of these heavyweight champs of the Lorain line. Both the Lorain-80

and Lorain-820 are designed for all operations — shovel, crane, dragline, clamshell, and hoe.

And both machines offer such outstanding advantages as big, sturdy, 2-speed chain drive crawlers; direct-to-the-point power transmission on the turntable, coupled with simultaneous hoist, swing and travel; and a rugged all-welded shovel boom.

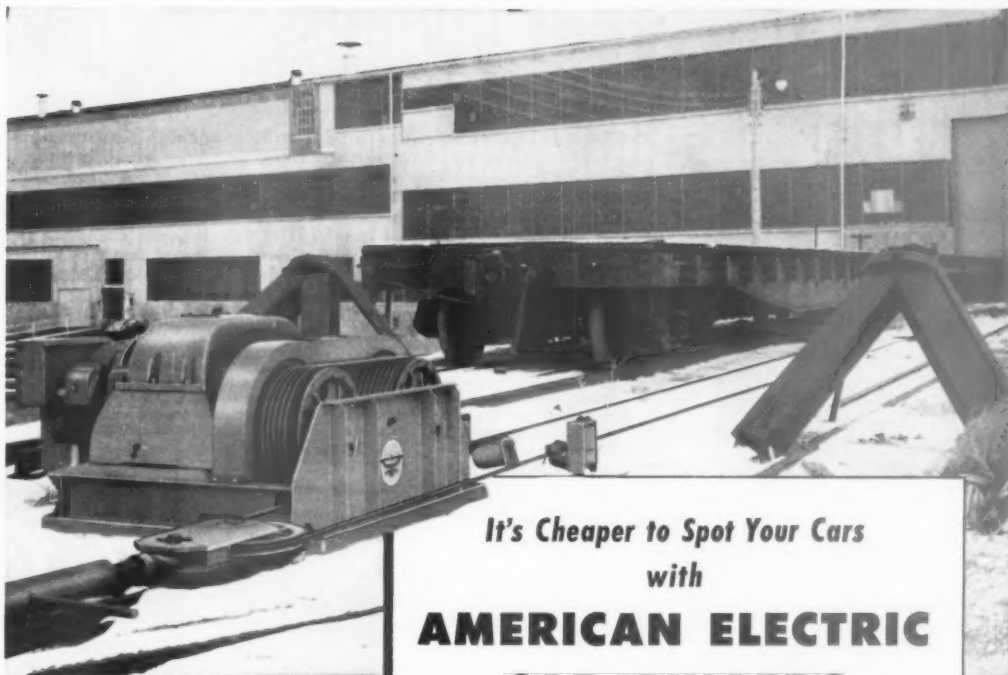
Regardless of which unit you select from the "Lorain-820 Series", you'll move far more rock when one of these shovels moves in. Call your local Thew-Lorain Distributor for complete details.



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AMERICAN ELECTRIC
CAR PULLERS**

**AMERICAN CAPSTAN
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Made in two sizes . . . 5,000 and 10,000 lb. starting line pull. Self contained in rigidly constructed welded steel housing. Worm gear, on tapered roller bearings, operates in oil bath.



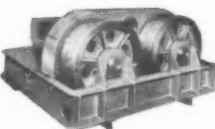
**AMERICAN DRUM
TYPE CAR PULLER**

Made in six sizes . . . from 4,000 lb. to 30,000 lb. starting line pull. Welded steel beds . . . low clutches for disengaging drums . . . outside contracting band brakes, foot operated.



**AMERICAN CONTINU-
OUS ROPE CAR PULLER**

Individually engineered to fit the job. Quotations and plans gladly furnished on receipt of information concerning the installation.



DO YOU KNOW what it costs you to spot a freight car? Count up the minutes lost while your men are waiting for the switch engine . . . the delays that occur while each car is being spotted. At best, it's a slow, expensive process, requiring the work of several men.

With the AMERICAN Electric Car Puller, *one man* moves cars the instant you want them moved . . . gets the job done quickly . . . and spots cars to loading docks with absolute accuracy. Simple, rugged design in these Car Pullers assures dependable, trouble-proof operation. They are ready for work on a moment's notice, but never cost a penny for "stand-by" time. And in limited space, AMERICAN Electric Car Pullers eliminate completely the slow, dangerous job of moving cars manually with a pinch bar.

The three major types of AMERICAN Car Pullers shown here range in capacity from 4,000 to 30,000 lbs. They cover almost every need in industry. For helpful information on a specific installation, contact your AMERICAN distributor or write us direct. For catalog, mail the coupon below.

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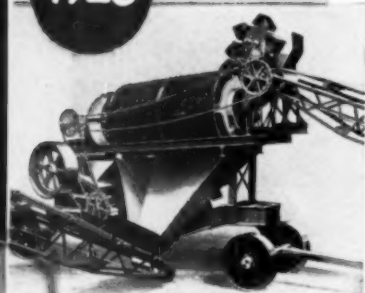
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35

Year after year **Cedarapids** gives

1923



BACK in 1923, the Cedarapids One-Piece-Outfit put high capacity aggregate production *on wheels* for the first time. Year after year since then, Cedarapids portable plants have been improved, increasing production from 20 to 250 tons per hour and even more. The use of big roller bearings, manganese steel, rubber tires, V-belts, universal drives, horizontal vibrating screens and hundreds of other improvements have resulted in aggregate producing plants that are world famous for big volume production with the lowest possible operating and maintenance costs, easy portability and highest quality aggregates. Today, there's a full line of Cedarapids Portable Crushing and Screening Plants, in sizes and types to fit every product requirement and every job.

20 tons per hour with this Cedarapids "first", built in 1923...the One-Piece-Outfit consisting of a bucket elevator, a jaw crusher and a revolving screen, all on wheels. With this first

really portable unit, the aggregate plant could be moved wherever necessary to crush and screen whatever was closest to the job, without loss of time or profit-eating costs.

1949

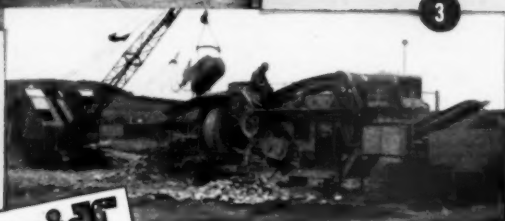
CRUSHING and SCREENING PLANTS

1 Cedarapids Master Tandem producing aggregate for paving a new 4-lane free way through Santa Ana Canyon. With capacities up to 250 tons per hour, the Master Tandem is the all-purpose gravel plant with the versatility to handle many different contract requirements.

2 This Cedarapids Junior Tandem makes traffic-bound material for a modern stone and sand company, whose postwar renovation program has raised the plant capacity from 500 tons to 1500 tons per day.

3 Cedarapids Pitmaster on a Canadian job easily produces 35 cu. yds. per hour, with 55% crushing. The Pitmaster Straightline is the smallest complete Iowa portable crushing and screening plant.

4 Capacities of 250 tons per hour, and more, with Cedarapids Unitized Crushing and Screening Plants, consisting of any combination of the basic primary crushing, scalping, secondary crushing, and wet or dry screening units. Each unit can be used alone or in combination with the others to handle every aggregate job.



Buy the Best...

Cedarapids

Built by
IOWA

The IOWA LINE of Material Handling Equipment Includes:

ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS - STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • STRAIGHTLINE ROCK AND GRAVEL PLANTS • FEEDERS-TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE PLANTS • PORTABLE GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TANKS • WASHING PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS

**YOU more production
more profit
less maintenance!**

TIME has brought many changes in machines and methods since the first Cedarapids Pre-Mix Asphalt Plant was setting records of 30 tons per hour . . . high production for the first portable plant of the 20's! Now the need for output as high as 100 tons per hour of accurately batched materials has resulted in the modern Cedarapids line of Bituminous Mixing Plants, known throughout the industry for their great capacities, low upkeep and low operation costs. Made up of matched screens, pug-mills, batchers, elevators and other component parts, they are built for maximum efficiency, easy portability and economy. They produce a steady flow of thoroughly mixed materials.

30 tons per hour with the first Cedarapids Pre-Mix Asphalt Plant. Continuing research and the development of increasingly better

machines have enabled Cedarapids to give you greater production of bituminous mixes at lower operating costs that assure good profits.

1923



BITUMINOUS MIXING PLANTS

1949

5 Cedarapids Model "E" Batch Type Bituminous Mixing Plant produced an average output of 700 to 800 tons per day on an airport job that called for mixing 305,700 sq. yds. of flexible base and asphalt surface runways.

6 Model "EA" is the most portable Batch-Type Bituminous Mixing Plant in the Iowa line. Can be set up ready for operation in a few hours. This plant, operating in Ohio, produces 450 tons of bituminous materials per day.

7 This Cedarapids 1000 lb. Model "A" Bituminous Mixing Plant produces a steady 200 to 250 tons per day. Accurate batching, thorough mixing and simplicity of operation keep product quality high and costs low.

8 Cedarapids Patchmaster, a rugged, low-cost continuous-mix Bituminous Mixing Plant, produces 30 tons per hour and more of uniform, thoroughly coated and mixed aggregate. This Patchmaster can be equipped with a 48" x 16' Cedarapids Drier and Dust Collector.

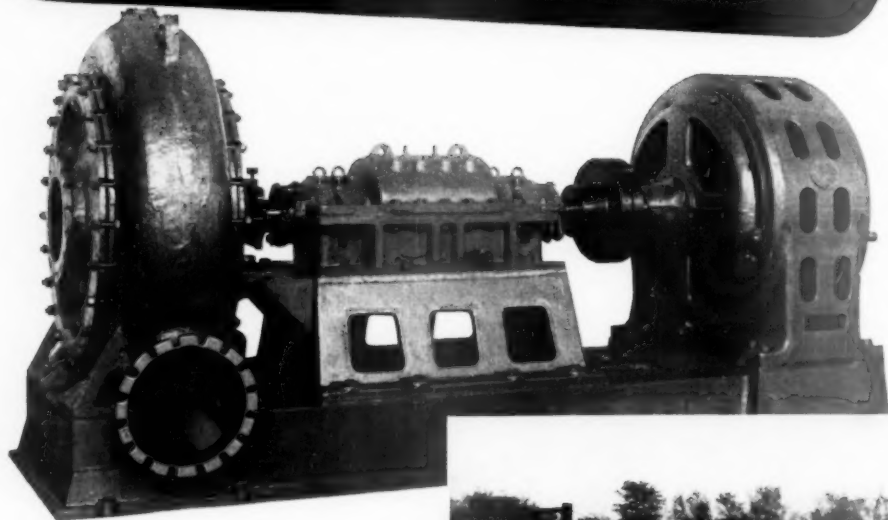


buy Cedarapids . . .

See Your Cedarapids Distributor For Full Details

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

700,000 Ton Shell Life....



with an AMSCO DREDGE PUMP

The record of this Amsco Pump is impressive. Built in 1929, it has been in almost constant use ever since . . . and is still giving "excellent service", according to reports from Kershaw Mining Co. For example, the latest replacement was a shell after the pump had handled about 700,000 tons of material through it.

Long life and efficient service are the rule, rather than the exception, with Amsco pumps. Simple, rugged design is one reason. Another is



Kershaw Mining Co.'s dredge "Chickasaw" pumping aggregate (45% gravel, 55% sand) on the Illinois River. Amsco type XH 15" pump is used.

the use of manganese steel castings for the water end . . . for only manganese steel can withstand the shocks of sucked-in boulders combined with the drastic wearing action of sharp sand and gravel. For complete information concerning Amsco dredge pumps, write us.

AMERICAN

Brake Shoe

COMPANY

AMERICAN MANGANESE STEEL DIVISION

CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.

First in heavy-duty truck sales for 17 straight years!



America's most exacting truck buyers **AGAIN** give Internationals a vote of confidence!

Actual 1948 registration figures for new trucks of 16,001 pounds and greater GVW ratings show this nationwide preference for Internationals:

Internationals	26.4%
Truck "B"	14.3%
Truck "C"	13.3%

This marks the 17th successive year that Internationals have led in heavy-duty truck sales! Would men who buy on a basis of performance give a No. 1 rating to any truck unless it gave them a No. 1 value?

Outstanding value—right down the line! The same basic values that have kept Internationals first for 17 straight years in the heavy-duty field, are yours in any International Truck model. Heavy, light, or medium-duty, your International Truck is *all* truck. There's no compromise with passenger car design.

Trucks built to meet your requirements. Among the 22 basic International Truck models and 1,000 differ-

ent truck combinations, there's a truck that's right for *your* job. In the range of gross weight ratings, from 4,400 to 90,000 pounds, you get the power, the frames, the axles you need for efficient hauling.

PLUS—the nation's largest exclusive truck service organization! 4,700 International Truck Dealers and 170 Company-owned Branches are ready with trained mechanics, precision-engineered replacement parts and low-cost rebuilt exchange units . . . ready to keep your International rolling at peak efficiency.

A truck transportation engineer is ready to help you! Call your nearest International Dealer or Branch, and find out how Internationals can step up the efficiency of your hauling. Trained International Truck transportation engineers will help you analyze your job—recommend a truck to lick it. If you're interested in profits, you'll call *soon!*

International Harvester Builds McCormick Farm Equipment . . . Farmall Tractors . . . Industrial Power Motor Trucks . . . Refrigerators and Freezers

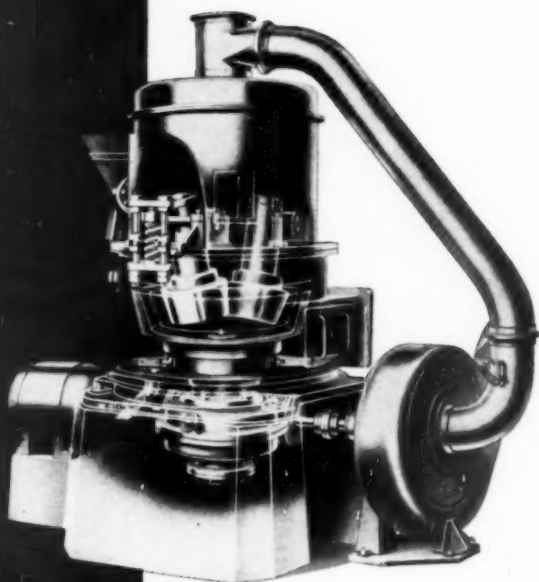


Tune in James Melton and "Harvest of Stars," NBC, Sunday afternoons

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY • CHICAGO

ROCK PRODUCTS, June, 1949



ng

Raymond Bowl Mill direct-firing unit available in a range of sizes for large and small plants.

AIR Separating

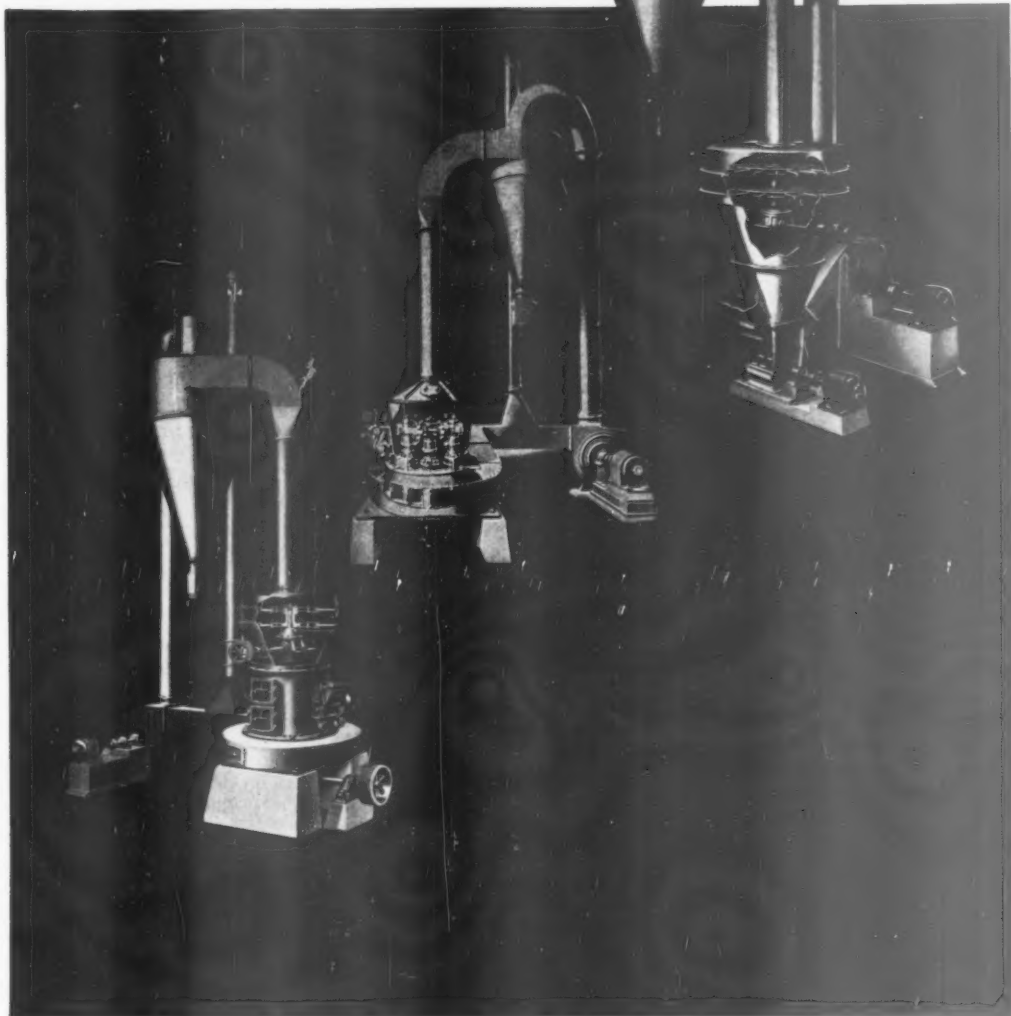
To modernize is to economize . . . and this holds good in the lime industry where you can realize definite savings over your old methods by equipping your plant with the latest type of Raymond machinery.

The Raymond line includes units for pulverizing limestone to various grades of fineness suitable for coal mine dusting, as a cattle feed mineral additive, for asphalt filler and the superfine filler materials . . . Equipment for disintegrating, purifying, and classifying hydrated lime, to make mason's lime, and extremely fine chemical and spray lime . . . Direct firing mills for grinding coal, and delivering it in powdered form directly to rotary lime kilns.

Roller Mills are available for drying and pulverizing, separating and conveying the product, all in one operation . . . Automatic Pulverizers for disintegrating and classifying hydrated lime and rejecting impurities to produce a superfine grade of finished material . . . Mechanical Air Separators for closed circuit grinding operations . . . and Bowl Mills for efficient direct-firing systems.



PULVERIZED LIMESTONE and LIME PRODUCTION



COMBUSTION ENGINEERING-SUPERHEATER, INC.

RAYMOND PULVERIZER DIVISION

1307 North Branch Street, Chicago 22, Illinois

Sales Offices in Principal Cities

Canadian Office: Montreal



SYMONS

CONE CRUSHER

and

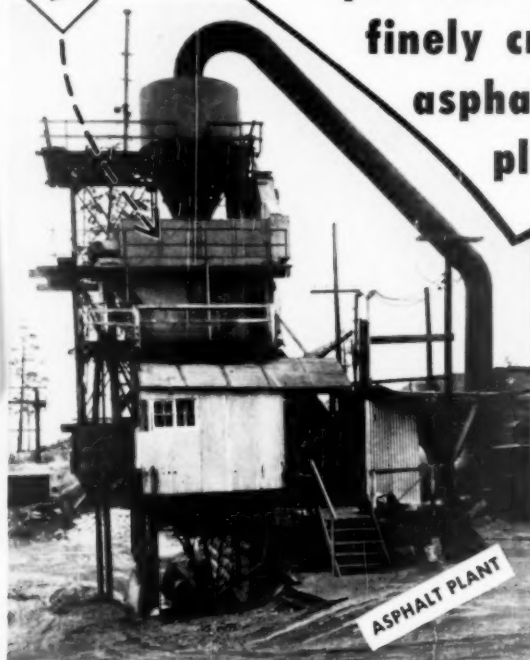
VIBRATING SCREEN

PRODUCE

65 Tons

per hour of

finely crushed basalt for
asphalt road materials
plant



WHERE fine crushing is involved, Symons Cones are without equal in producing large tonnages at low crushing costs. The Inland Asphalt Company is producing 65 tons per hour of finely crushed and properly graded basalt with a Symons 3-ft. Standard Cone Crusher and a 4' x 12' triple deck enclosed Horizontal Screen. Company spokesmen estimate the Symons Cone could easily produce about 75 tons per hour with no loss of fine crushing efficiency... and this on the harder basalts of the Northwest.

If your operations call for crushing or screening, Nordberg equipment has the answer to your problem. A complete line of processing equipment is available in a wide range of sizes to fit your requirements of feed, product and tonnage. Write for detailed information.

C649

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN

NEW YORK • SAN FRANCISCO • WASHINGTON • SPOKANE
MEXICO, D.F. • LONDON • TORONTO • JOHANNESBURG

NORDBERG

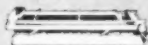
*Machinery for processing
ores and
industrial minerals*



Gyratory and
Jaw Crushers



Symons Cone
Crushers



Vibrating Screens
and Grizzlies



Grinding
Mills



Diesel
Engines

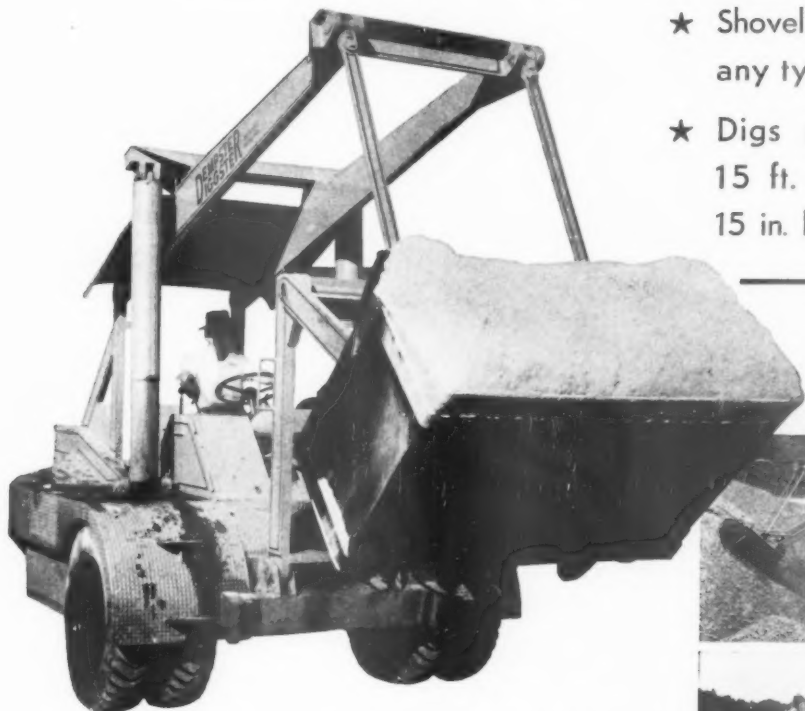
**NOW YOU GET INDEPENDENT CROWD AND
HOIST ACTION WITH THE**

DEMPSTER DIGGSTER

TRADE MARK

**THE AUTOMOTIVE
HYDRA-SHOVEL THAT-**

- ★ Shovels and Loads any type material
- ★ Digs solid earth 15 ft. above and 15 in. below grade



Here is a rubber tired automotive shovel that is equally at home in excavation work; in stockpiling, loading or on the road. It is the most compact and maneuverable, one-man-operated, rubber tired automotive shovel and loader available. It is the only machine built with simultaneous but independent hydraulic crowd and hoist action. Variable crowd action at any dipper position means it can dig lower—15 inches below grade. Exclusive hoisting action

means it can dig higher—digs out a 15 ft. bank. Extraordinary dumping height and reach means easier loading, even distribution of load in the largest of trucks. Dempster-Diggster buckets are easily interchangeable. For digging, a 1 cu. yd. (heaped) bucket with hardened steel teeth is used. For loading work, stockpile buckets are available in 1¼, 1½ and 2 cu. yd. capacities. Hoisting, Crowding, Steering and Braking are all 100% hydraulic.

**DEMPSTER
BROTHERS
INC.**

Large photo above shows close-up of Dempster-Diggster with 1½ cu. yd. digging bucket loaded. At right, top: Loading crushed stone. Center: Diggster dumps crushed stone into truck. Right, bottom: Digging out a high bank.

Write today for complete information.

369 N. KNOX, KNOXVILLE 17, TENN.



PLYMOUTH LOCOMOTIVE **Takes 60-Hour Week in Stride**



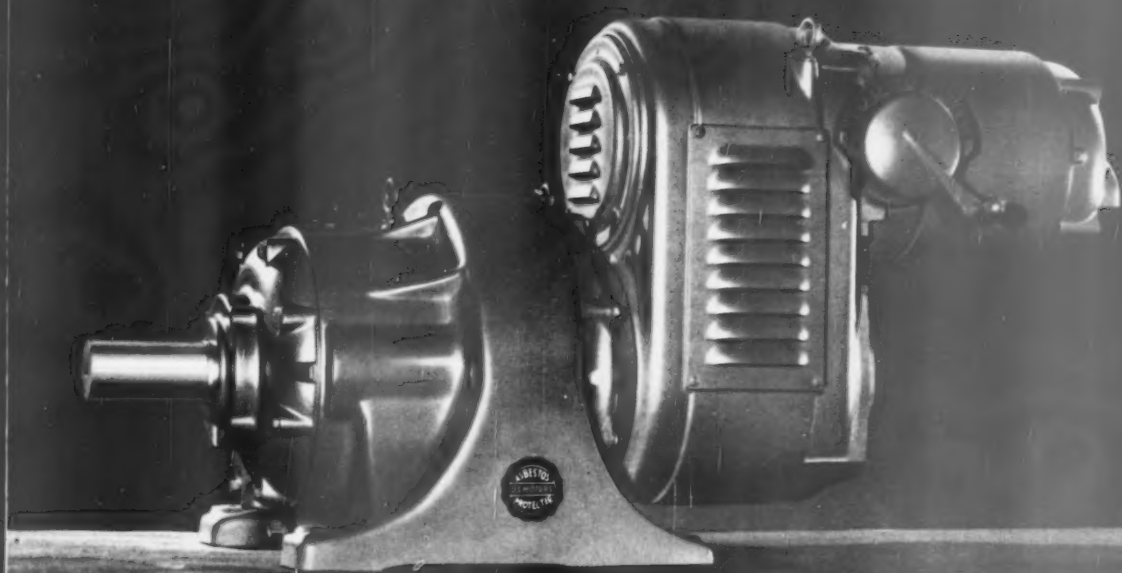
Dependable performance? For two full years this 8-ton Plymouth Locomotive at the Hutton Company, Kingston, New York, manufacturers of brick products, has been operating on a 60 hour week — without any breakdowns.

Hauling clay on a 36" gauge track the Plymouth at the Hutton Co. provides the same economical, dependable intra-

plant haulage furnished by hundreds of other Plymouths in every type of industry.

There's a Plymouth designed to handle your intraplant transportation in less time, at lower cost. Details are available without obligation . . . write today. Address Plymouth Locomotive Works, Dept. A-5, Plymouth, Ohio.

PLYMOUTH LOCOMOTIVES
GASOLINE, DIESEL MECHANICAL AND DIESEL ELECTRIC
PLYMOUTH LOCOMOTIVE WORKS • Division of The Fate-Root-Heath Co., Plymouth, Ohio, U.S.A.



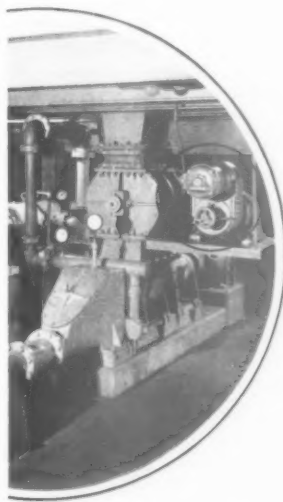
Type VEV-GD—Double Reduction Combination Varidrive-Syncro gear

NEW TREND IN ROCK PRODUCTS PLANTS

Geared power with variable speed

Sometimes you want slow motor speed; other times higher speeds. A fixed speed motor can't give your powered equipment full flexibility. But with the U. S. Combination Varidrive-Syncro gear Motor you have an infinite range of operating speeds to select from. Whatever your process-requirements, the U. S. Combination Varidrive-Syncro gear Motor can be instantly adjusted to provide the exact driving speed. This flexibility increases your plant production. Speed ranges from 1 to 10,000 rpm are available. These units are self-contained and are housed in dust-proof enclosures, as pictured above and in the typical installation at the right. Where fixed operating speeds only are advantageous, install the U. S. Syncro gear Motor. Made in single, double and triple reductions with gear ratios as high as 262 to 1.

For *multiplied* torque, install the
U. S. SYNCROGEAR MOTOR



U. S. Varidrive on Fuller Kinyon Rotary Feeder for controlling rate of conveying material from pulverizer to storage.

(Turn to next page)

"Torqued-up" power for "up-hill" pull



Conveyor powered with Syncrogear

Give your Rock Products plant *multiplied torque* with rugged, dynamically-designed U.S. Syncrogear Motor

Overloaded motors are a constant source of concern in Rock Products plants. Not enough torque. Now, by installing U. S. Syncrogear Motors you get power with multiplied torque without resorting to the use of external gear boxes. The Syncrogear can be selected in any gear ratio desired. As low as 10 rpm—up to 10,000 rpm. Geared power is the answer to your power problem. The U. S. Syncrogear provides a self-contained, sealed gear-train built in a rugged pyramidal gear case that will withstand all stresses. The motor is also housed as an integral part of the unit. The windings are asbestos-protected. No housing is required. The problem of the entrance of dust is eliminated.



HOPPER—5 hp U. S. Syncrogear Motor operating reciprocating feeder in sand pit of a Rock Products plant. Exposed to atmosphere without danger.



CLASSIFIER—This sand classifier needs no housing to protect the motor. It's powered with a U. S. Syncrogear Motor.

UNPROTECTED



Note open motor on a shaker screen installation and metal housing required in attempt to keep out dust, dirt and grit.

PROTECTED



Here is same shaker screen powered with U. S. Syncrogear Motor. Self-protected. No harm from dust. No cover needed.

U. S. SYNCROGEAR MOTOR

10 TO 10,000 RPM

ANY RATIO

1/4 TO 30 HORSEPOWER

Ask for descriptive Syncrogear Bulletin

U. S. ELECTRICAL MOTORS Inc.

PACIFIC PLANT: Los Angeles 54, Calif. • ATLANTIC PLANT: Milford, Conn.

District Offices: Boston 16, New York 6, Philadelphia 2, Pittsburgh 22, Chicago 8, San Francisco 7, Seattle 4



Heavy-Duty Style C
Screens for Handling
Pit-Run Material

Screened 23 Million Tons Aggregates for Coulee Dam

WHEN GRAND COULEE DAM, one of America's greatest engineering projects was under construction in Northern Washington, this battery of heavy-duty Allis-Chalmers Style B vibrating screens was on the job 21 hours a day.

They screened *millions of tons* of pre-scaled pit-run material — sand, gravel, chunks of sharp rock as large as 6 inches . . . sometimes feed ran as high as 4,000 tons per hour.

Yes, when that job was done, 23,000,000 tons had been put through these 5 by 10 ft double deck screens! And they were by no means "finished." Farmed out to other sites, they continued their useful screen life for years.

CHECK IMPORTANT FEATURES

Performance like this is something you

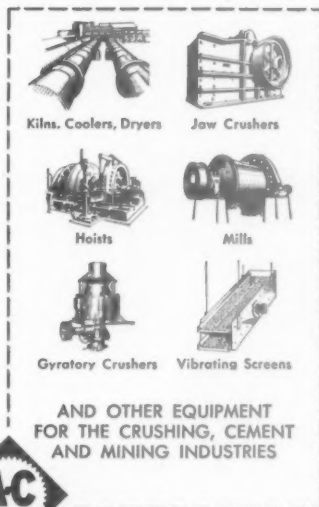
can expect when you specify Allis-Chalmers vibrating screens for your job. They're built of high tensile steel alloys. Screen cloth support frames are "stress-relieved" to eliminate possible strains around welds.

You choose from *five separate types* of vibrating screens — for *any* application, from pit-run scalping of 3 by 4 ft pieces to fine 35-mesh sizing.

Every A-C screen recommendation is based on a thorough analysis of operating conditions by a trained screen engineer. There is an A-C man in your area who can help you cut screening costs . . . increase capacity. Call him today. A-C offices or distributors in principal cities in the U.S. and throughout the world.

A 2652

ALLIS-CHALMERS, 975A SO. 70 ST.
MILWAUKEE, WIS.



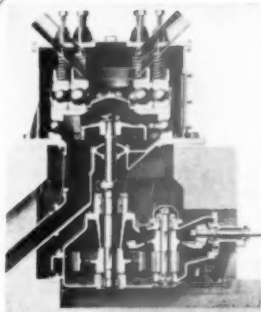
AND OTHER EQUIPMENT
FOR THE CRUSHING, CEMENT
AND MINING INDUSTRIES

ALLIS-CHALMERS

ROCK PRODUCTS. June, 1949

*doing a
better job
at lower cost
for MEDUSA*

Installation of two center-fed B&W Pulverizers in raw grind department at Dixon, Illinois, plant of Medusa Portland Cement Co. Three-stage grinding elements are shown in sectional view of mill at right.



The B&W Closed-Circuit Raw Grinding System

With economy and more uniform kiln-feed as their principal objectives, Medusa Portland Cement Company, Dixon, Ill., recently completed a two-year plant rebuilding program. With six kilns, the annual plant capacity is about 1,500,000 bbl.

Raw grinding is accomplished with two B&W Type B Pulverizers, in closed circuit. Material containing over 5 per cent moisture is handled successfully.

Large output, uniform fineness, and long, efficient service-life are some of the advantages that result from B&W's unique ball-bearing principle of grinding.

Write for Bulletin 3-439, which describes this installation.



**BABCOCK
& WILCOX**

THE BABCOCK & WILCOX CO., 85 Liberty St., New York 6, N. Y.

ROCK PRODUCTS, June, 1949

Here's the **MULTICLONE** Story in a Nutshell...

IT SAVES SPACE

and we mean really important space savings. The chart here tells only part of the story because, in addition to being far more compact both in square and cubic footage, the shape of the MULTICLONE can be adjusted to fit various space requirements—long and narrow, short and wide, or square. You can often fit the MULTICLONE into tight spaces or waste areas too small for other equipment!

Model	Relative Space Requirements	
	In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

IT RECOVERS THE "FINES"

as well as the coarser particles. Its patented cone design and small diameter tubes generate higher centrifugal forces, thus recovering a large percentage of the very fine particles 10 microns and less in addition to the heavier particles. MULTICLONE's high recovery of both small and large particles means high overall efficiency on any application!



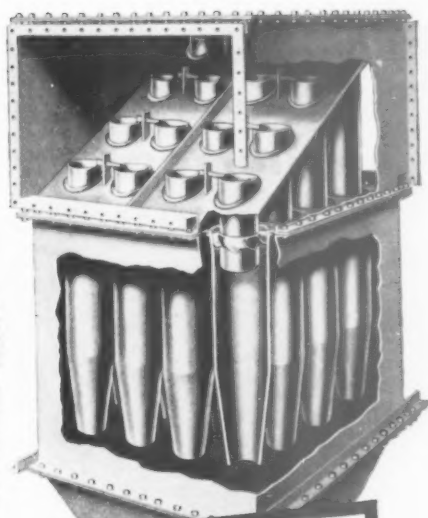
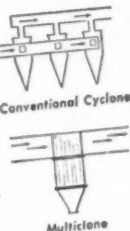
IT IS UNUSUALLY ADAPTABLE

for, in addition to the shape adaptability outlined above, inlet-outlet connections are also easily adaptable. For low headroom, install the MULTICLONE with side-inlet, side-outlet. Or for tight side clearances, use side-inlet, top-outlet connections. Still other arrangements are possible for special conditions!



IT IS SIMPLE

both to install and to maintain. For example, the MULTICLONE requires only single inlet and outlet ducts compared with the complicated multiple ducts of conventional cyclones. Not only saves space—but is simpler and cheaper to install and insulate. Moreover, the MULTICLONE has no filters to clog, no high-speed moving parts to maintain... and a single collecting hopper serves an entire bank of tubes!



On any dust recovery job
— large or small —
the **MULTICLONE**
has many advantages!

WHY LIMIT your dust recovery job to one or two performance features when the Multiclone combines so many important advantages in the one unit? Check over some of the Multiclone's multiple savings outlined at the left. Note how — on every important feature — the Multiclone is the answer. These and other Multiclone advantages are the result of experience gained through more than 38 years of specialization in the science of dust recovery, beginning with the first commercial application of the well-known Cottrell Electrical Precipitator. Take advantage of these years of specialized study by installing Multiclone.

GET ALL THE FACTS. Send for this booklet that describes the many MULTICLONE advantages. Also let our trained engineering staff study your particular problem and show how MULTICLONE's multiple savings will benefit you. No obligation, of course.



**WESTERN
Precipitation
CORPORATION**

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR
COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1006 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
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MULTICLONE
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TURBULANCE
SPRAY DEVICES

**When you need Conveyors, Elevators,
or Power Transmission
Equipment.....**

Specify
CONTINENTAL



"DS" TAKEUPS



SCREW CONVEYORS AND ACCESSORIES



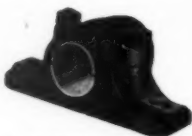
SCREW ELEVATORS



BUCKET
ELEVATORS



BELT CONVEYOR IDLERS
AND ACCESSORIES



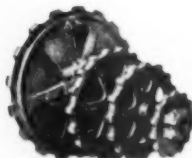
BABBITTED AND SKF
PILLOW BLOCKS



COUNTER SHAFT
BOX ENDS



V-BELTS AND
SHEAVES



SPROCKETS
AND CHAIN

Materials handling and power transmission equipment engineered and manufactured by Continental is famous for long life, dependability and economical operation.

Send us your problem or requirements. Our engineers will gladly assist you in designing an efficient layout, planned for long service and low maintenance expense.

CG-4903

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ENGINEERS



ATLANTA

DALLAS

MEMPHIS



MANUFACTURERS

right...

...on the nose



... and you will be right if that nose ring is made of Thermalloy.

Thermalloy nose rings reduce operating costs by reducing replacement costs.

More burned clinker comes from kilns equipped with Thermalloy nose rings because they seldom have to be shut down to rebuild the discharge end. They provide for expansion and prevent excessive warping and cracking. Segments are flush with the kiln shell and do not require special brick.

Before you place an order for that next nose ring, call Electro-Alloys. Let one of

our engineers show you how Thermalloy can save you money on nose rings and other kiln parts.

Thermalloy Kiln Parts Include:

Feed Pipes	Conveyor Burner Nozzles
Chain	Feed Chutes
Outlet Grates	Kiln Shell Segments
	Kiln Dampers

AMERICAN

Brake Shoe

COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO



A section of Steel Thimble Roller Chain. When you have need for such chains — call on Jeffrey, their originator.

CHAINS are important but often they are given little consideration until all else is accounted for. Whether for conveyors, elevators, other unit machinery or for driving purposes — correctly designed chains are highly essential. Chain is one of our earliest products — we know how to build it exceptionally well. A complete line — also attachments, sprockets and transmission machinery.

THE JEFFREY

MANUFACTURING COMPANY Established 1877

939 North Fourth St., Columbus 16, Ohio

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Birmingham 3
Boston 16
Buffalo 2

Chicago 1
Cincinnati 2
Cleveland 13
Denver 2

Detroit 13
Hartford 2
Houston 5
Huntington 19

Jacksonville 2
Milwaukee 2
New York 7
Philadelphia 3

Pittsburgh 22
St. Louis 1
Salt Lake City 1
Scranton 3

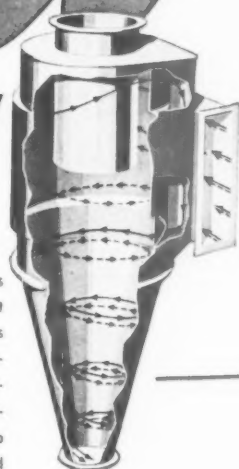
Complete Line of
Material Handling,
Processing and
Mining Equipment



Simplicity... an absolute must in

dust

RECOVERY



Complex design with many small parts multiplies the chance of trouble in any dust recovery system. The ideal equipment has no moving parts to maintain, no small passages to clog up and cause expensive shut-downs. Buell sticks to the large high-efficiency cyclone design-proportioned to each individual job. It is based upon sound aerodynamic principles which result in high operating efficiency with a minimum of turbulence and wear. An added refinement is the exclusive van Tongeren 'Shave-Off'—without which no truly efficient cyclone performance can be expected.

It takes a multi-page catalog to discuss the problems of collector efficiency in dust recovery. Buell publishes such a book, which is yours for the asking. Write: Buell Engineering, 2 Cedar Street, Suite 5000, New York 5, N.Y.

buell

Engineered Efficiency in
DUST RECOVERY

UNIVERSAL

HAS THE ANSWER TO YOUR WASHING PROBLEMS WITH "STREAM-FLO" ENGINEERED WASHING PLANTS



Stationary washing plant with mechanical feed, conveyors, vibrating screen; water sprays, sand screws, leading bin, primary and secondary crushers, and stock piling conveyors. Electric powered.



Crushing screening and washing plant with primary jaw crusher, secondary roll crusher, scrubber classifier, conveyors, and bins.

WRITE FOR COMPLETE FACTS



Universal washing and screening plant with plate feeder, conveyor, two deck screen, 3-compartment bin, sand screw, and miscellaneous sprays, chutes and flumes. Gasoline or diesel power.

● Universal builds stationary and portable plants to meet any washing need. "Basic Unit" construction means lower initial cost, and "Stream-Flo" engineering assures a well balanced, smooth operating plant. Result—more yards per hour at less cost per yard. For profit-making production of clean, properly sized aggregate, investigate Universal.

UNIVERSAL ENGINEERING CORPORATION

617 C AVENUE N. W., CEDAR RAPIDS, IOWA

DIVISION OF PETTIBONE MULLIKEN CORPORATION

ENGINEERS AND BUILDERS OF "STREAM-FLO" ROCK, GRAVEL, AND LIME PLANTS
SCREENING AND WASHING PLANTS, CONVEYORS, APRON FEEDERS

OTHER PETTIBONE MULLIKEN PRODUCTS

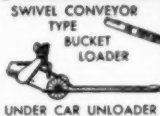


PETTIBONE
BUCKETS

HAISS BUCKET LOADERS



PMCO SPEED
LOADER



SWIVEL CONVEYOR
TYPE
BUCKET
LOADER

UNDER CAR UNLOADER



PORTABLE
BELT
CONVEYOR



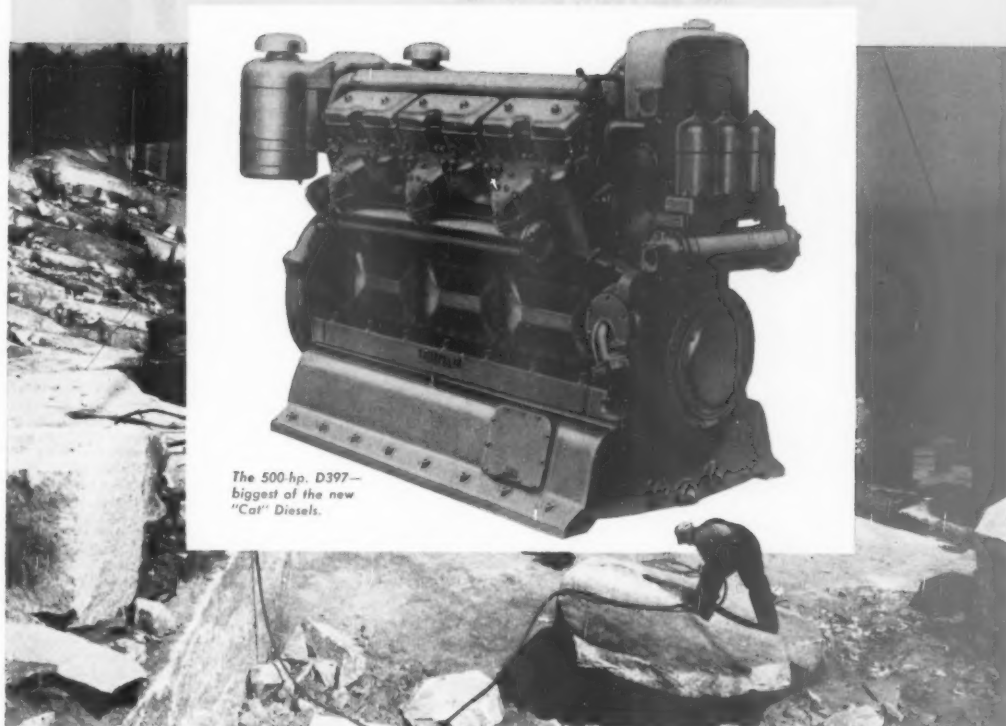
PETTIBONE MULLIKEN CORP.

CHICAGO, ILLINOIS

GEORGE HAISS MFG. CO., INC.

BRONX, NEW YORK, N. Y.

New **BIG YELLOW ENGINES BUILT TO HANDLE BIG JOBS**



The 500-hp. D397—
biggest of the new
"Cat" Diesels.

Pit and quarry men have learned from long experience that they can always depend on "those big yellow 'Caterpillar' Diesels." They've proved themselves in shovels, draglines, dredges, crushers, gravel plants, air compressors, and electric power systems.

Now you can power even bigger machines—with new, bigger "Cat" Diesels. In addition to present models, four great new Engines, ranging up to 500 hp., and four new Electric Sets, generating up to 314 kw., are now coming out of the world's finest, most modern engine

factory. Every one is designed to burn low-cost, non-premium fuels—assuring substantial savings. Every one is given a closely supervised dynamometer run to assure proper break-in and full horsepower output.

When you buy new rock, gravel or brick machinery, specify "Caterpillar" Diesels for power. When you consider replacing the power in your present equipment, call on your reliable "Caterpillar" dealer. For immediate information, SEND IN THE COUPON.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL

**ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT**

CATERPILLAR TRACTOR CO.
Box BP-48, Peoria, Illinois

Send me specifications on the new "Cat" Diesel Engines and Electric Sets.

Name

Address

Can you match these figures?

Pioneer Jaw and Roll Crushers produce
300 tons of 1" minus granite an hour
near San Pedro, California!



Here's one of the most dramatic production stories in the quarry industry . . . tremendous production . . . amazing maintenance . . . precision reduction. Again, a PIONEER Jaw Crusher, Roll Crushers, and Vibrating Screens have proved the answer to a tough production job.

Livingston Truck and Materials Co., produces crusher run base rock for street sub-grade, water front fill and for plant mix asphalt. The rock . . . granite of variable hardness. Their product . . . about 300 tons of 1" minus crusher run base an hour.

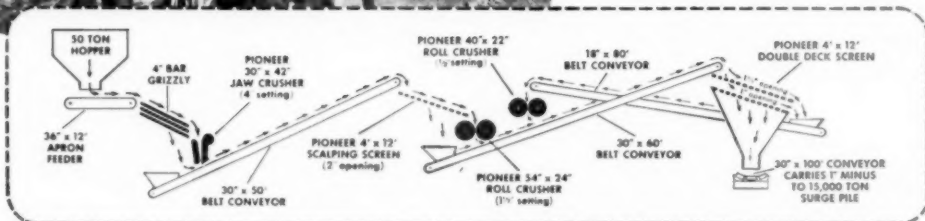
While production is high, maintenance has been equally low. Here's what Mr. Carder Livingston, General Manager, says:

"The performance of the PIONEER 54 x 24 Roll Crusher with respect to capacity and economy of operation has been remarkable. Before installation of the PIONEER 30 x 42 Jaw Crusher, the Roll Crusher received rock from the old primary to about 8", set at about 2". It crushed approximately 1,000 tons per day over a 9 month period before resurfacing the roll shells. This same Roll Crusher now receives 5" to 6" material and is producing 1200 tons a day. The roll shells show virtually no wear after 6 months use."

Production stories like these are no surprise to those quarry operators who own and operate PIONEER Roll Crushers. With 100% of the shell surface a working surface, roll crushers have a higher capacity for fine materials than any other secondary crusher. PIONEER Roll Crushers are made in four sizes . . . to fit any job in pit, mine, or quarry. Why not write us for full details today? Delivery is prompt!

PIONEER ENGINEERING WORKS

1515 Central Avenue • Minneapolis 13, Minnesota



BUY BOTH!

Higher Output,
Lower Upkeep!

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Continuflow EQUIPMENT



How long should a QUARRY truck last?

The life of any truck depends upon many things. It depends upon the miles the truck is driven; on the care taken to keep it in good condition.

But more than all else, truck life depends on how closely the truck *fits* the job it must do.

Dodge "Job-Rated" trucks last longer, and at low maintenance cost . . . because they *fit the job*.

It stands to reason that you waste money with a truck that's too big for its job; or, if your trucks are too small for the job, you're in for plenty of costly maintenance expense . . . and early replacement.

From 248 basic chassis models your Dodge dealer can specify a truck that will be "Job-Rated" exactly for your hauling job.

Such a truck will have the right one of 7 great truck engines . . . "Job-Rated" for top efficiency and economy. It will have the right units throughout . . . to haul your loads, over your roads.

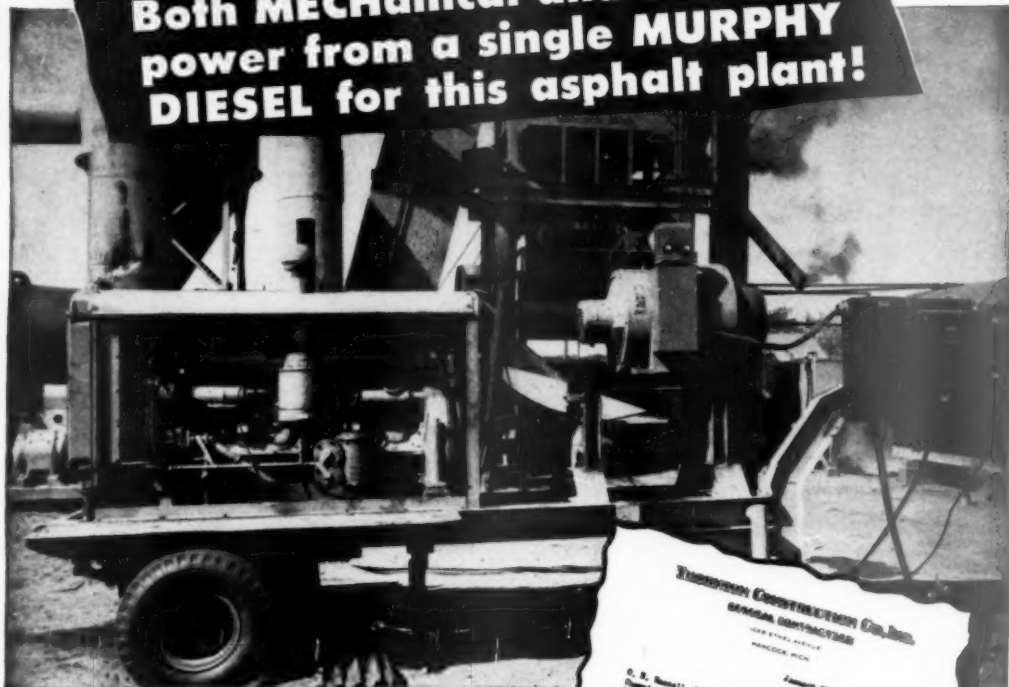
And remember . . . only Dodge builds "Job-Rated" trucks. Talk to your Dodge dealer!



For the good of your business -

Switch to **DODGE**
"Job-Rated" **TRUCKS**

Both MECHANICAL and ELECTRIC power from a single MURPHY DIESEL for this asphalt plant!



MURPHY DIESEL MECH-ELEC UNITS PROVIDE A COMPLETE POWER PACKAGE

FOR jobs where the advantages of a mechanical drive are necessary for the major load, but the flexibility of electrical power is desirable for secondary loads, Murphy Diesel now offers the MECH-ELEC Unit. A complete, packaged power plant, it is capable of delivering varying proportions of mechanical and electric power simultaneously. Electric power as required, up to 50 K.W., may be taken from the generator while the remaining unused portion of the engine's full rated power can be taken off the shaft mechanically. The generator can be operated without engaging the mechanical drive.

Two MECH-ELEC models are now available: The Model ME-6, rated at 135 H.P. continuous, 160 H.P. intermittent; and the Model ME-66, rated at 150 H.P. continuous, 180 H.P. intermittent. Both are equipped with 50 K.W. generators. The ratings indicate the total mechanical power available.

Ask your Murphy Diesel Dealer for full information or write direct.

MURPHY DIESEL COMPANY

5315 W. Burnham Street
Milwaukee 14, Wisconsin

MURPHY DIESEL

THOMPSON CONSTRUCTION Co., Inc.
GENERAL CONTRACTORS
NEW EVEL, ILLINOIS
MUSKOGEE, ALA.

January 20, 1949

O. E. Russell, Sales Manager
Thompson Co.
New EVEL, ALA.

Dear Mr. Russell:

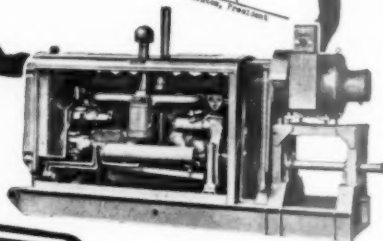
Just spring on purchased from you a Murphy ME 66 Diesel Power Plant to drive our new 1000 Square Portable Asphalt Plant. It drives the asphalt mixing plant directly. The drive shaft pump, and the generator set is driven by a separate electric motor. The generator is equipped by 75 KVA generator drive from each end of the shaft.

We were a little afraid we were expecting the work from the Murphy Diesel but we are pleased to say it completely filled our power requirements. The generator on this drive is too quiet to be heard over the noise of the plant and is completely satisfactory.

We are happy to say that the Murphy Diesel ME 66 has been very satisfactory and the combination of Diesel and Electric power has made the plant more portable and is a desirable combination.

Yours truly,

THOMPSON CONSTRUCTION CO., INC.
F. M. Thompson, President



Murphy Diesel Engine and Power Units, 90 to 190 H.P. Generator Sets, 60 to 116 K.W. Combination MECHANICAL and ELECTRIC Power Units, 135 to 180 H.P.

Look to **P&H** for Added Values



Rock Bottom HANDLING COSTS

Where the digging is toughest . . . that's where P&H performance shows up strongest . . . in the pit, or in the yard. Continuous, low cost handling is assured by P&H Added Values like these:

Hydraulic Control — faster, easier, velvety action — easier on both man and machine.

Planetary Chain Crowd — rapid reversing, more accurate; outlasts 25 to 30 crowd cables.

True Tractor Type Crawlers — smoother, more dependable travel; freedom from usual crawler troubles.

Easier Steering — you can make sharp or gradual turns — or right-about-face without stopping.

Welded Construction Throughout — rolled alloy steels make them huskier, shockproof; no needless deadweight.

P&H Added Values mean more for your excavator dollars. Write today for full information.



DUAL-POWERED P&H TRUCK CRANES. One engine for high speed mobility . . . another for maximum work capacity. And with remote control, you get one-man operation. Fully convertible for all classes of work.



P&H CRAWLER MOUNTED EXCAVATORS are built in all sizes up to 6 cubic yards capacity: gasoline, Diesel or electric powered. Write for literature.

P&H

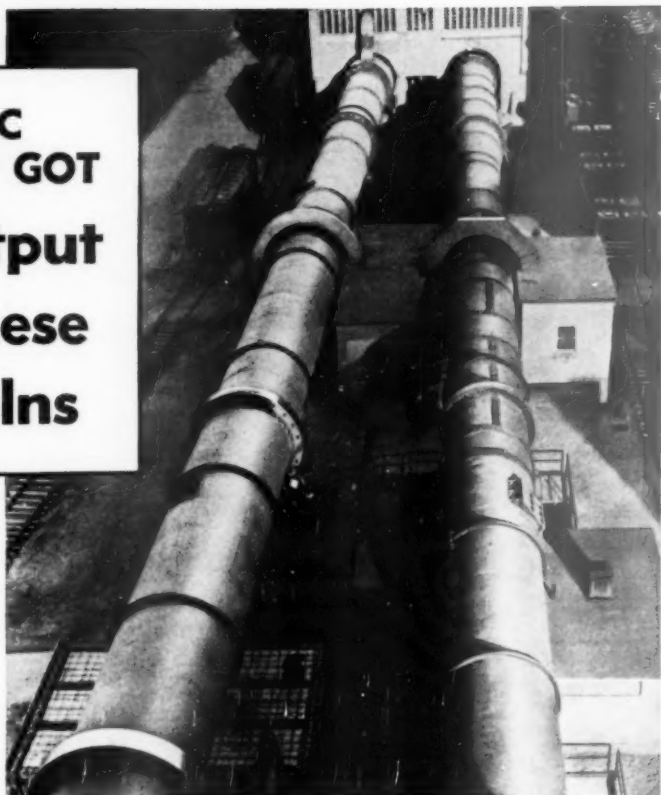
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EXCAVATORS • ELECTRIC CRANES • ARC WELDERS • P&H • HOISTS • WELDING ELECTRODES • MOTORS

HOW BASIC REFRACTORIES GOT Bigger Output — With These *Longer* Kilns



MAGNEFER, used in open hearth, bessemer and electric furnaces as "shovel fill" refractory, is produced by Basic Refractories, Maple Grove, Ohio. Magnefer is made by dead-burning dolomite and iron ore flux to a temperature of approximately 3,000° F. in rotary kilns.

Like thousands of other companies, Basic Refractories was faced with the problem of stepping up production to meet a huge demand for their product.

A low-cost solution was found by making use of two existing short kilns at a great saving in first cost. These kilns were joined together and added to (with a special section), making a 328 ft unit. The second kiln was then engineered and built by Allis-Chalmers to match the first.

Considerations of length, arrangement and the many other complex factors involved in a rotary kiln installa-

tion were worked out to obtain maximum economy as well as the desired capacity.

Result? Substantially increased production and a lower cost per ton than was possible with the shorter kilns.

CHECK A-C EXPERIENCE, FACILITIES

Whatever your burning process, it will pay you to consult Allis-Chalmers.

- ▶ A-C experience covers over 50 years of rotary kiln engineering.
- ▶ Hundreds of successful kilns installed.
- ▶ Allis-Chalmers shop and manufacturing facilities are unsurpassed.

The Allis-Chalmers representative in your area is as close as your phone. Call him today, or write for Rotary Kiln Bulletin 07B6368. Offices or distributors in principal cities in the U.S.A. and throughout the world.



Kilns, Coolers, Dryers



Jaw Crushers



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AND OTHER EQUIPMENT
FOR THE CRUSHING, CEMENT
AND MINING INDUSTRIES

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ALLIS-CHALMERS

the AIRSLIDE

FOR CONVEYING:

PULVERIZED PHOSPHATE ROCK

PULVERIZED LIMESTONE

HYDRATED LIME

CEMENT

**DOES THE JOB BETTER
... LOWERS OPERATING COSTS**



Bin equipped with Airslide withdrawal conveyors, delivering into distributing Airslide conveyor. The use of Airslides in bin bottoms makes it possible to obtain a self-emptying bin, of maximum capacity, where head room is limited.



Fourteen-inch Airslides taking output of nine separators, total capacity 225 tons per hour. Illustrates the adaptability, flexibility, and simplicity of an Airslide installation. Note simple supports and the ability to make a change in direction.

ADVANTAGES

- Extremely low power consumption
- Small volume of air at low pressure
- Dustless operation
- High capacity with low head room
- Ease in change of direction
- Ease of erection
- Simple floor or overhead support releases valuable floor space for other purposes
- Permits flexibility of plant design, not available with straight-line conveyors
- Low maintenance
- Noiseless operation.

ELIMINATES

- Industrial accident hazards
- Lubrication
- Complicated and expensive drives; such as chains, belts, speed reducers, etc
- Frequent and costly interruptions in production
- Costly labor charges to make repairs and replacements
- Large stock of spare parts
- Weight and bulk.

In this unique conveyor, partly aerated pulverized materials flow, by gravity, on a slightly inclined, porous surface. It comprises a lower channel, (air-chamber) having an upper surface of porous material, upon which the material flows, and an upper channel to contain the material.

A novel feature of the design is a porous surface of low-air permeability, which assures uniform distribution of low-pressure air, e.g., 6-in. W.G. The flow of material starts and stops almost instantly with control of the air supply. The quantity of air is too low to cause dusting, or to require dust collecting equipment. It can be emptied, sufficiently for practical purposes, by stopping the feed and continuing the flow of air for a short period.

Write for Bulletin FH-1, giving full details.

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FULLER-KINYON, FULLER-FLUXO, AIRVEYOR, F-H AIRSLIDE CONVEYING
SYSTEMS . . . ROTARY FEEDERS AND VALVES . . . ROTARY COMPRESSORS
AND VACUUM PUMPS . . . INCLINED-GRATE COOLER . . . DRY PULVERIZED-
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UNITS . . . AIRLIFT . . . CONSTANT-HEAD FEEDER . . . SLURRY VALVES
MOTION SAFETY SWITCH . . . SAMPLERS

FH-5



**ROTARY
KILNS**

Machinery for Cement-Lime-Ore

In addition to a complete line of Rotary Kilns and Grinding Mills, F. L. Smidth & Co. also manufacture Coolers, Pre-Coolers, Pre-Heaters, Recuperators, Air Separators, Agitators, Packers, Extractors, Feeders, Burners, etc. and their auxiliary equipment, for the manufacture of Cement, Lime, Ores, and Allied Products



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MILLS**

F. L. SMIDTH & CO.

11 WEST 42ND STREET

**CEMENT ENGINEERING
CEMENT MACHINERY**

NEW YORK, N. Y.

"WE HEAR..."

June, 1949

The Supreme Court has again held that basing points are illegal. In a 4 to 4 decision, the high court affirmed the opinion of a court of appeals holding the use of basing points in the Rigid Steel Conduit industry to be a violation of the Federal Trade Commission Act, Iron Age reports.

Freight carloadings in the mid-west in the second quarter of this year are expected to be 1.7 percent below the like 1948 period. The Mid-West Shippers Advisory Board forecasts carloadings in the April-May-June period of 948,267 cars in the territory, compared with 964,320 cars actually loaded for the same commodity groups during the second 1948 quarter. Decreases are expected in shipments of gravel, sand and stone; fertilizers; and lime and plaster.

New dwelling units started in March fell behind a year earlier for the seventh month in a row. "Starts" numbered 62,000 in March, 1948 against 75,100 in March of 1948. March's total was the best since November, however.

The drive for strategic stockpiling of foreign scrap is picking up momentum, Iron Age Reports. Latest move is the Munitions Board's request that the Scrap Subcommittee of the Iron and Steel Industry Advisory Committee draw up recommendations on the subject. Such a program would assure continued movement of foreign scrap to this country, at the same time relieving consumers of the need for high priced contracts to bring it here. Stockpiling scrap might prove a future bulwark against rebounding prices.

Labor trouble looks more and more ominous for this summer, Business Week reports. Users of coal are stockpiling against a possible strike. And users of steel are stockpiling in some cases against (1) a steel strike, or (2) a coal strike that would stop steel.

Sixteen state legislatures now have bills proposing gasoline tax rate increases, a survey by the National Highway Users Conference reveals.

U. S. corporations plan to spend \$8,806,000,000 for new plants and equipment in the final half of 1949. This represents a 14 percent reduction over a like period a year ago; though similar expenditures were up 5 percent in the first half of the year. Largest declines are expected by manufacturing firms while increases are anticipated for railroads and utilities.

Average weekly factory earnings decreased \$1 to \$53.37 in March, according to the Bureau of Labor Statistics, largely because of shorter work weeks.

Builders of railroad equipment turned out in 1948 the greatest number of freight cars since the early 1920's. Total delivered to domestic railroads last year was 112,634, an increase of 44,082 over 1947 deliveries.

WE HEAR

Employment of production workers, reflected in man-hours, declined to 12,362,000 in March, 769,000 below last year. Average hours declined to 38.9 per week, down 0.5 from February and 1.5 from a year ago. However, output per man-hour appears to be rising in some industries.

* * * * *

"Sandwich walls," consisting of concrete layers and cellular glass insulation, have been used successfully in several new buildings in the United States and Canada, Wall Street Journal reports. The walls are said to weigh about 1/3 as much as ordinary masonry walls, speed construction, and allow savings in foundation, handling and skeleton frame costs. They are installed in panels, usually six inches thick, with a 2-in. cellular glass center between 2-in. concrete layers.

* * * * *

Production of raw steel was at its greatest in industry history during the first quarter of this year, officials report. Output was 24,000,000 tons and for the first time in any three-month period, furnaces were operated at an average exceeding 100 percent of capacity.

* * * * *

Plant expansion has slowed down, with expenditures for improvement and equipment falling \$3,000,000,000 since January, U. S. News & World Report states.

* * * * *

Upward trend in highway construction will continue in 1949 with an estimated expenditure of \$1,233,546,000 on state and federal-aid roads as compared to \$1,111,600,000 and 33,657 miles in 1948 and \$846,153,000 and 30,279 miles in 1947, a state-by-state A.R.B.A. survey shows. The survey also shows \$433,603,000 for maintenance in 1949 as against \$415,126,000 for 1948 and \$377,181,000 for 1947.

* * * * *

Gypsum and rock phosphate will be used in amounts up to .05 percent to prevent softening of canned potatoes as soon as the Food and Drug Administration authorizes use of calcium salts in the canning industry. Tomato canners have been using calcium salts in amounts up to .026 percent to prevent softening of their product.

* * * * *

In its annual report to the Secretary of the Interior, the Bureau of Reclamation noted that it had let 1400 contracts, for a total of \$160 million during 1948.

* * * * *

A cure for silicosis, one of industry's worst diseases, may lie in aluminum therapy, Mining Engineer, reports. By adding aluminum powder to silica dust, investigators found that the silica would not dissolve in the lungs to produce toxic concentrations of silica solution. Results of aluminum treatment of silicotics carried on over a period of three years show that 65 percent of the men improved, and none became worse.

* * * * *

Virtually all of the federal-aid funds provided under the 1944 postwar Federal-Aid Act have been expended on new roads, Col. E. R. Needles, president of the American Road Builders' Association, states. Out of a total authorization of \$1,500,000,000, the sum of \$1,425,394,287 has been expended for new highway construction completed, or in the process of completion.

* * * * *

Wholesale prices of industrial goods declined to 148.4 on the Bureau of Labor Statistics index for the week ended April 19, down 0.7 percent. This was the biggest drop for a single week since January, 1933.

THE EDITORS



*let's bring this
into focus... on your
products...*

VALUE, in terms of Chase Bags, means that your products are packed in containers that are backed by more than a century of improvement. Result: you get **GOOD LOOKS, POSITIVE PROTECTION, DEPENDABILITY!**

Furthermore, you also get a container designed to *your specific needs*.

Your Chase Salesman will be glad to give complete details. He is a packaging expert who knows his business... and who knows how to best apply it to *Your Business*.

Check on this important subject—your inquiry will receive prompt attention.



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Chase Liners—
Crimpled and
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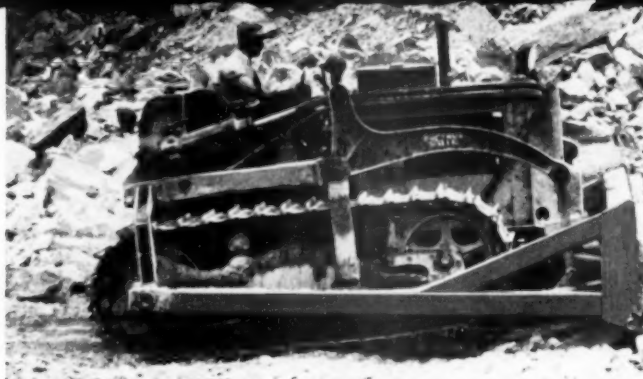
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ROCK PRODUCTS, June, 1949

73

RIGHT for your ROCK



BUCYRUS-ERIE BULLDOZERS AND BULLGRADERS ARE TOUGH IN ALL THE RIGHT PLACES FOR "LIVING WITH" THE TOUGHEST ROCK

- Liberal use of small castings produced by our own modern foundries.
- Careful laboratory selection of steels.
- Wide use of special hardening and heat treating processes.
- Design that provides great strength without unnecessary weight.

TOUGH blade • Manganese steel with high wearing properties, high tensile strength. Cutting edge is special wear-resisting alloy steel. Heat treated, hard surfaced alloy steel corner shoes. Back reinforced with flanged beams.

TOUGH main frame • Strong welded box-section construction. Bullgrader frame has castings at the corners. No overlaps at points of connection, no points of stress concentration. Trunnions are flame hardened to resist wear.

TOUGH rocker arms, rods • Arms are selected steel castings produced by our own foundries, have great strength. Connecting rods are upset forgings specially heat treated for hardness.

TOUGH cylinders and cradles • Cylinders are of close-grained semi-steel for long cylinder-wall life. Cylinder cradle is strong welded box structure, with bottom side open.

TOUGH connections • Strong pin connections link moving parts. Renewable bushings, easily replaceable in the field, keep connections tight.

RESULT: Longer life for both equipment and tractor

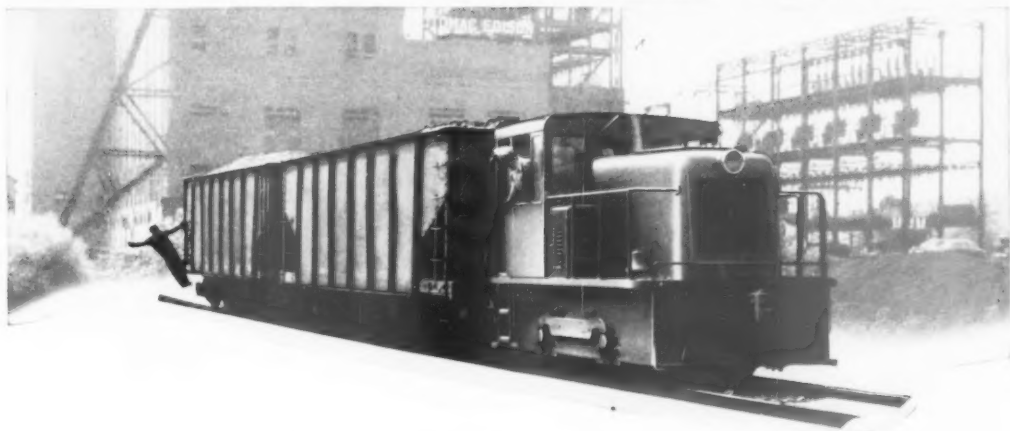


BUCYRUS-ERIE CO., South Milwaukee, Wis.

136749

See Your **INTERNATIONAL** Industrial Tractor Distributor

HOW MUCH WILL YOU SAVE?



**G-E locomotive at eastern plant saves \$4288 in one year
... will pay for itself in less than four years.**

"Our G-E 25-ton diesel-electric switcher is saving us \$4288 a year; and, it's doing 30 per cent more work in the same amount of time, than the 30-ton steam locomotive it replaced," says the power plant superintendent* of an eastern utility.

Since it arrived on the job in March 1947, the snappy G-E locomotive has had an availability of 99.2 per cent. Working a six-day week, 7½ hours a day, it hauls twelve 50-ton cars of coal at one time.

30.0 Per-cent Investment Return

The \$4288 yearly saving is about 30 per cent of the original investment, thus the economical 25-tonner will pay for itself in less than four years. Here are
*Name furnished on request.

the savings in detail:

<u>Diesel-electric (25-ton)</u>		<u>Steam (30-ton)</u>
\$397.80	Fuel	\$3650.00
121.70	Lube Oil	
41.67	Maintenance	1200.00
<u>\$561.17</u>	<u>Total</u>	<u>\$4850.00</u>

Your Savings Estimated

Over 1500 G-E switchers are saving thousands of dollars in many types of industries. Have your nearest G-E representative show you how diesel-electrics can cut costs in your own plant. Our transportation specialists will survey your switching requirements — estimate your savings in advance. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

DO YOU HAVE THESE FACTS ON LOW-COST SWITCHING?

Section AQ-4909
General Electric Company
Schenectady 5, N. Y.



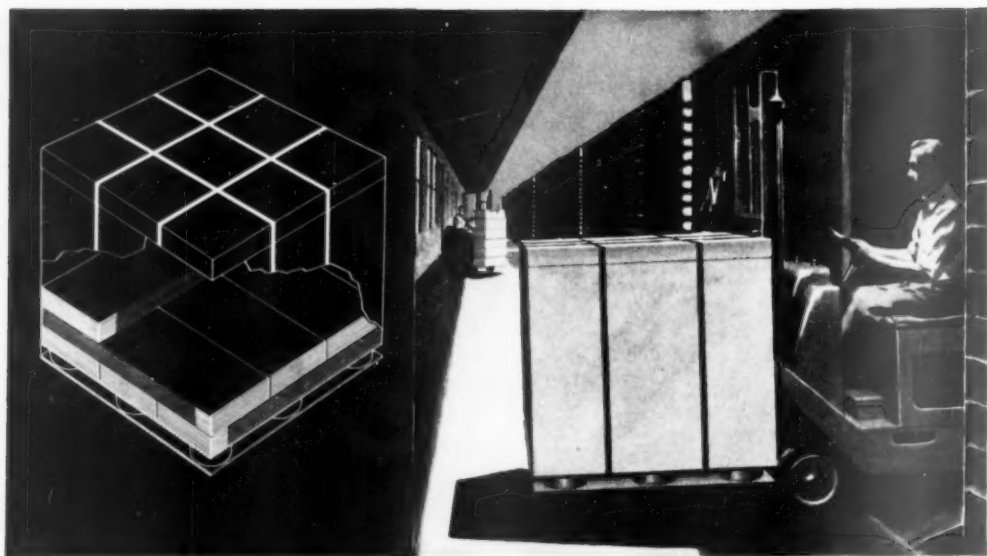
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FREE BULLETIN

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Without obligation send me your fact-filled locomotive bulletin "Switch to Diesel-electrics and Save."

GENERAL  ELECTRIC



Your
Union Multiwall Specialist
 will show you how to make
Handling Labor more productive

ONE of the hidden costs in packaging is in the handling of packaging materials from unloading dock to warehouse to packaging assembly line.

Thanks to new ways of shipping and handling, many firms now find savings in handling costs alone more than justify a switch to Union Multiwall Bags. The Union Multiwall Specialist who calls on you, can tell you all about the recent cost-cutting developments in handling of multiwall bags.

He'll show you, too, why more than 300 industries now find Union Multiwall Bags cut packaging costs all along the line—in handling, packaging, shipping—yes, and in better product protection, too.

Even if you're now using multiwall bags, the Union representative who calls on you can give you new ideas to save money. For he is backed by the skilled engineers and packaging experts of America's largest maker of paper bags.

Let him show you how Union resources and packaging experience can help you!



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Editor's Page

How Many Companies Will Survive Economic Adjustment?

A RETURN to anything like pre-war conditions of a buyers' market will determine to what extent industries have over-expanded. It is obvious that a much greater volume of business than existed in the 1930's is going to be required in order to utilize sufficient capacities of plants in order to keep them profitable.

President Melvin H. Baker of the National Gypsum Co., in a speech delivered before the National Lime Association convention, which is reported in this issue, brought up the question as to how many lime plants are likely to survive under intense competitive marketing. He speculated as to whether or not there would come a return to "ill-considered" marketing practices like those that prevailed in the years before the war when, with lime plants operating at something like 60 percent of capacity, weaker companies were eliminated and there came a marked drop-off in numbers of plants.

How many small producers will survive an economic adjustment? Speculation on the answer to that question is going on in all industries where there has been ambitious expansion in productive capacity, but circumstances will be the determining factor. Certainly the small producer of lime, and other rock products, can do a lot to protect his future.

Of all the rock products industries, the lime industry is unique in the direction it has taken with respect to numbers. There has been a steady shrinkage in numbers of plants for twenty years or more which continued even through the peak production years during and subsequent to the war. Production back in 1925 was approximately 75 percent what it is today and there were 450 active plants. Only 182 producers were active in 1946.

How Many Plants?

Greatly responsible for the consistent downward trend in numbers of lime plants has been the building of large rotary kiln plants which, by their size and by virtue of better products than many small producers were in position to market, forced some of them out of business. The shifting of big consumers of lime, like the paper and textile industries of New England, into other locations has also left its toll in lime plants.

Whether or not the trend to fewer and larger plants will continue, depends to a great extent on what the smaller producer does to protect his business. It certainly seems to us that the small producer has a place in a competitive industry if he will make a good product and sell it wisely.

In many cases he stands to benefit, if basing point pricing continues to be held in violation of law, and certainly in view of the high level of freight rates even though the basing point ruling be rescinded.

A large producer, if his plant must at some time go idle for several months, likely could find it much more difficult to survive than the small producer. A small, established producer has comparatively little overhead and does not have the enormous interest on capital investment to pay, for a large capacity plant that cost so much to build that it really was at a competitive disadvantage from the time it went into production. We doubt very much if shrinkage in numbers of lime plants will ever reach the point when, as some fear, the industry might be accused of having insufficient competition within its own ranks.

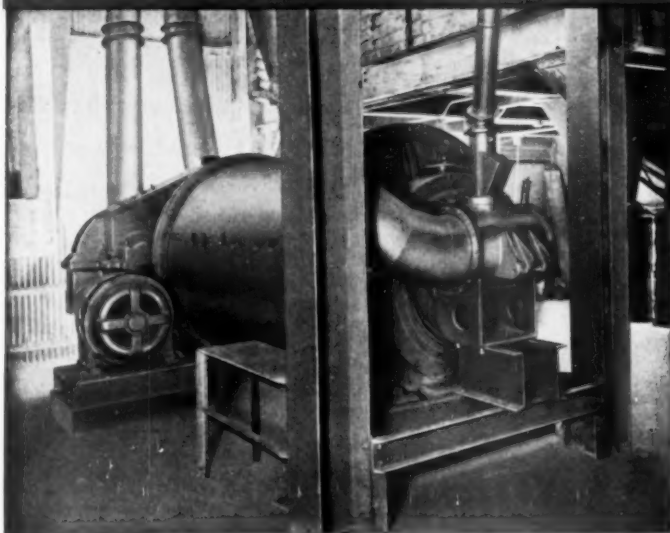
The Course to Follow

Mr. Baker said in his talk before the lime convention that the industry is just awakening to the potentialities of its product and he implied that research can expand markets to the extent that there would be much more volume of business to be spread among producers than there ever had been in the past. The need for creative selling, low cost plant operation and service were also stressed as essential for market preservation and enlargement.

These suggestions are by no means limited to large producers even though the small concern may be unable to have a research laboratory or even its own testing laboratory. A small plant can be cheaply modernized, sometimes only in details, for more uniform burning and control, which is extremely important to quality of lime. And it would not entail great expense or research in order to quarry selectively, or more so, with the view to improving the final product through burning limestone of the best available composition.

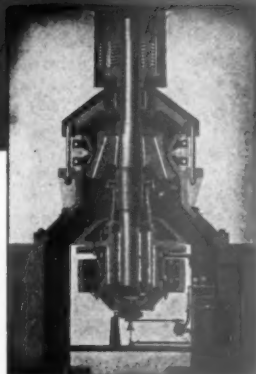
Producers of all sizes should participate in industry-wide research such as we report in this issue. There is much to be learned about intelligent application of the results of research by which capital can be made of the peculiar properties of individual lime products and even for some of those which necessarily are burned from inferior limestones. The trade waste field is an example.

Bro Nordberg

KVS*Machinery for*AGRICULTURAL LIMESTONE
AND
LIME MANUFACTURE

THIS 5½' x 8' KENNEDY AIR SWEEP TUBE MILL PRODUCES 7 TONS PER HOUR — With a feed of ¼ x ¾ in. limestone and dust

Use the Kennedy Air Swept Tube Mill to get superfine grinding at bottom costs. The product ground in this tube mill and collected in three cyclones is (1) 5 tons per hr. of 80% thru 200 mesh, (2) 1 ton per hr. of 92% thru 200 mesh, and (3) 400 lbs. per hr. of 99.8% thru 325 mesh. Simple adjustment permits a desired variation from this combination of fine mesh sizes. The mill is driven through the remarkable Kennedy Integral Gear Drive for Tube Mills. This enables the motor to be direct-connected to the high speed shaft. The gears cannot be misaligned or set wrong. Power required to drive the mill is thus greatly reduced.



KENNEDY ROLLER BEARING GEARLESS CRUSHER

With a Synchronous Motor built in its pulley, this machine shows 80% saving in the cost of maintenance and a saving of 50% in power over geared crushers. It has produced 156 tons per hour when set to 7/16" between the head and concaves at the bottom. The motor runs on roller bearings and is continuously lubricated by a force feed lubrication system. The motor is built especially for this crusher.

It is now possible to combine the superior product of a rotary kiln with the operating economy of a vertical kiln with the Kennedy Stone Preheater and Deheater. By partial calcining the material this system reduces kiln wear and kiln lengths. It recovers and utilizes exit gases, and has proved so efficient in actual operation that 40% fuel savings and increased output exceeding 20% have been obtained.

Short kilns employing the Kennedy method also acquire an internal glaze which lessens the wear on kiln liners, lowers the power requirements, and reduces formation of kiln rings. Overburned and underburned lime is practically eliminated. Coal feed and lime calcination are switchboard controlled.



The latest in scientific lime production KENNEDY STONE PREHEATER - ROTARY KILN DEHEATER and SOAKING PIT

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Kennedy-Van Saun Manufacturing and Engineering Corp.

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Rocky's NOTES

Nathan C. Rockwood

Dilemma of Highway Builders

READERS OF NEWSPAPERS in some of our industrial states as for example, Pennsylvania, Indiana and Illinois know that the state highway departments are attempting to enforce laws limiting wheel and axle loads on highways. (Some producers may know from experience!) These laws have been on the books for a number of years, and they were designed to limit loads beyond which highway engineers knew their pavements would be destroyed. During the war, for obvious reasons, these laws were not enforced; and largely as a result of these excessive loads and dense truck traffic, highway pavements in these areas are in a deplorable condition.

Many miles of pavement are in such bad condition that they must be replaced. However, replacement cost with present 60c dollars is about double the original cost; and since such replacements must be wider, thicker pavements on adequately ballasted subgrades, the replacement cost will probably be at least three times the original cost. Add to this the fact that many miles of these "old" pavements were built from the proceeds of bond issues, yet to be paid off, and it is all too obvious that the economic problem alone is a difficult one.

Intensive Selling Job Needed

In a country which has an automobile for practically every family, there is probably no kind of public improvement more earnestly desired and more universally enjoyed than paved highways, to say nothing of their necessity for commercial transportation. Yet the general public is noticeably apathetic about providing any new money for highways. The reasons are not far to seek. In the first place the general public is being taxed to the limit of endurance for a host of other alleged social benefits, national, state and local. In the second place, according to state highway authorities, the general public is sour on highway engineers and builders in general, because it thinks that the "permanent" highways, constructed 20 or more years ago, have gone to pieces much faster than anticipated.

As a result of this public apathy, there is necessity for again selling the

average citizen on highway construction; and this job is going to be far more difficult than the original campaign to "get people out of the mud." The public realizes in a general way that the pavements it has already paid for, or is still paying for, should have been adequate for their own needs for many years more. The early destruction has come about chiefly from excessive and unanticipated commercial use of the highways; and the public's dividends from such commercial use while probably very real are not very tangible. Hence, the public is sympathetic to laws restricting the commercial use of the highways, and probably favors higher license fees.

It is not our purpose here to argue the merits or otherwise of the constantly more intensive commercial use of the public highways, or to debate whether or not highway transportation companies are making adequate returns for their use of the highways. They are well organized and ever alert to take care of their own interests. Naturally, they don't want their license fees and taxes increased. Yet, if they continue to use some of their present transportation units, the design and construction of highways will have to be radically revised to provide for this kind of traffic; and someone will have to meet the costs.

Maintenance and Repair Only

Highway authorities in Indiana and Illinois have made it clear, to some of the interested parties, that with present sources of income, there will be no highway funds available for new construction. The most that can be hoped for is to keep present state highways passable through constant patching and resurfacing. Since this work is widespread it means "bottle-necks" on nearly all through traffic routes, with annoying delays (to the highway user), and expensive and complicated handling of the construction work, most of which is done by state force account labor, which is none too efficient.

The amount of construction materials needed is, of course, only a fraction of what new or reconstruction would require, but the demand for these is statewide, and must go to

established commercial plants. Patching means, in most instances, new short sections of concrete, and in many instances the state highway departments are buying ready-mixed concrete for this purpose. Resurfacing generally means covering old concrete with two or three inches of black top, which of course requires small sized aggregate, usually crushed. In these ways, the highway engineers hope to prolong the life of present pavements 10 to 12 years.

Engineers and economists realize that this is not the best use of highway funds, but what else is there to do until enough new money is in sight to start a real highway reconstruction program? There are many pressure groups at work on the state legislatures besides that of the trucking interests. There are groups working for soldier bonuses, schools, pensions, etc. and etc. The only pressure group that seems interested in highway construction is that of farmer organizations, and its aim is to get more state aid for local roads, although farmers probably benefit as much or more than the city dweller from commercial trucking, they are getting tired of paying their share of the cost of maintaining interstate routes.

Must Face Truck Issue

The truck-highway problem is doubtless a touchy one to present to this industry in any light, because rock products producers and manufacturers are probably among those who violate the present state laws regulating truck and axle loadings. Some of the newest and largest ready-mixed concrete trucks, while they may not get out on the state highways very often, do exceed the load limits. Nobody wants to destroy another's investment in a piece of equipment bought in good faith, and the state highway authorities are no exceptions. With increased railway freight rates, truck hauling of heavy bulk commodities like aggregates has become more and more frequent, and is the only thing that has kept many producers in operation. Nevertheless, they owe it to their state and their communities as good citizens to help their highway authorities to meet these problems.

We think there should be a volunteer governmental advisory committee in every state, comprised of all the interests who use and pay for the highways, as well as those who furnish the materials and the construction work; first, to see the problem as a whole as it is faced by the highway engineers; second, to reach agreements among themselves which are fair and workable. Let us remember that we ourselves are the government in this country, and that no selfish pressure group gains anything for itself in the long run—that we can not have our cake and eat it, too. If we want any decent highways some 10 years from now, we must start working intelligently and cooperatively for them now.

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LABOR RELATION TRENDS

Status Federal Labor Relations Legislation

By NATHAN C. ROCKWOOD

EXPERTS SAY (at this writing) that there is little prospect of the House of Representatives taking any action on new labor legislation within 30 days, so it may be up again about the time this is published. Also, up to this time, the Senate has taken no action on the Thomas bill, which is the same as the original Lesinski bill presented to the House. These bills were designed to fulfill the Administration's promise to repeal the Taft-Hartley Act, which of course remains in effect in the interim. There are some observers who believe there will be no new labor legislation this year, for both Houses of Congress have many other more important matters to consider.

The history of the attempt to repeal the Taft-Hartley Act up to May 12 (this writing) is as follows: On March 24, the House Labor Committee reported out its Lesinski bill, which was approved by the committee 13 to 10 on a strictly partisan vote. This bill would have repealed the Taft-Hartley Act and revised the Wagner Act with a few amendments. However, these amendments, including restrictions on certain kinds of secondary boycotts and jurisdictional disputes, were opposed by labor union bosses, who insisted on full restoration of the Wagner Act. They offered no constructive suggestions, but only threats of retaliation to congressmen who would not do their bidding. Even the biased members of the Labor Committee of the House recognized the futility of any attempt to reinstate the Wagner Act without some changes.

Administration Demands

The Lesinski bill, however, would have made radical changes in the Taft-Hartley Act as follows: The Labor Board would keep its five members, but the semi-independent office of general counsel, whose duty it is to prosecute violations of the act, through temporary court injunctions, would be abolished. Unlawful secondary boycotts would be only those in which unions sought to compel an employer to violate the law, and those which might arise from genuine work-jurisdictional disputes. (The labor union bosses claim they can better settle these jurisdictional disputes among themselves, although they haven't been very successful at this in the past.) All other kinds of boycotts designed "to promote and strengthen collective bargaining" would be legalized.

Contract termination or modification would require 30 days notice, and it would be an unfair labor practice by either employer or union to terminate an agreement without filing such a

notice. The unions would be permitted to make closed-shop contracts, and the right to make such contracts would be protected against any state laws to the contrary. (This change is demanded since the U. S. Supreme Court has ruled that the states may regulate both union shop and closed shop under the Wagner Act as well as under the Taft-Hartley Act.) The Mediation Service, now an independent agency, would be returned to the Labor Department (which is believed by employers to be entirely pro-labor).

Strikes involving a national emergency would be met by the appointment of special boards and the bona fide vote of strikers on the last offer of the employer, as required by the Taft-Hartley Act, would be abandoned; also the cooling-off period would be much reduced. The Taft-Hartley Act ban on political expenditures by unions would be eliminated. There were other contemplated changes but those enumerated are perhaps the most important.

Discordant Views

About the same time (March 21) the majority report of the Senate Labor Committee was issued. It is a lengthy tirade against the Taft-Hartley Act in which it was claimed that the act has: "(1) Increased government interference with and restricted free collective bargaining; (2) hampered workers in the exercise of basic rights; (3) provided unsound procedures and administrative structures; (4) dealt with matters of public policy outside the proper scope of labor-management legislation; (5) discriminated unfairly against labor organizations." The bulk of this lengthy report is designed to sustain these allegations.

Public hearings on both the House and Senate bills had previously followed much the same pattern. The employer's point of view was probably stated in typical terms by H. P. Steele, representing the Chamber of Commerce of the United States. His objections to the Lesinski bill were given thus: The unions would not be obligated to bargain in good faith; the bill provided no limits as to how far the government would go to compel employers to bargain; mandatory subjects of bargaining were not listed; union abuses were not adequately regulated; the strikes which cause national emergencies were not sufficiently provided against. All business interests desire to see the Mediation Service kept separate from the Labor Department.

Quite general criticism regarding the present setup of the National Labor Relations Board, with its separately functioning general counsel, seems to

be well taken, since even the Hoover Commission's report on reorganization of the government executive departments considers this kind of organization bad, chiefly because the office of general counsel as now constituted provides an undesirable "blurring" of legislative and administrative functions, that under our system of government should be kept separate.

Minority Report

The Republican minority of the House Labor Committee submitted its report to the House March 29, in which it objected to the Lesinski bill on the following grounds: (1) It eliminates the Taft-Hartley Act provisions for dealing with national emergency strikes; (2) revises and commends the evils of closed-shop and closed-union contracts; (3) again puts workers at the mercy of organized union violence; (4) deals in entirely inadequate way with jurisdictional strikes and secondary boycotts; (5) makes the Wagner Act even more one-sided than it was in the first place; (6) denies the workers their political freedom; (7) in effect again denies employers freedom of speech; (8) by eliminating decertification elections, the opportunity for workers to rid themselves of dominating unions, which may no longer truly represent them, is denied; (9) exempts unions from an obligation to bargain; (10) extends protection of the law to supervisors, who are rightfully part of management; (11) would encourage Communist influence in unions; (12) would abolish the procedural reforms of the Taft-Hartley Act, which made N.L.R.B. hearings like courts rather than mere prosecuting implements.

Not all the opposition to the Lesinski bill came from Republican members. Representative Wood of Georgia, a Democrat of course, was ready with a substitute bill, which after some revisions to provide more concessions to labor than originally planned was ready for submission to the House on April 26, when debate on proposed new labor legislation was in progress. The Wood bill, as revised, would retain the provision of the Taft-Hartley Act which permits the various states to regulate or outlaw union-security agreements. However, the employer could permit a contracting union to supply applicants for jobs.

In the revised Wood bill, the ban on secondary boycotts was modified to permit boycotts or strikes where "justified by a clause or stipulation in a collective bargaining contract permitting employees to refuse to work on orders being performed for the account of an employer whose employees, who would normally perform such work, are engaged in a lawful strike." This alleged use of the Taft-Hartley Act for strike-breaking is one of the things most objected to by labor unions. The Wood bill would also permit strikers to vote in bargaining elections, if they are entitled to rein-

(Continued on page 140)



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The tough-slugging B37 makes fast work of light demolition jobs. It's light and safe in the hands of the operator who must work from scaffolding, or wherever footing is treacherous. It's built to endure years of hard work. Here are some of the reasons why:

Renewable chuck liner — easily replaced at low cost — a new liner protects both tool and breaker against a loose-fitting shank.

Double-life hammer — block type piston hammer is reversible for double life — an exclusive feature. Use of tappet minimizes wear on hammer striking face. Tappet operates in renewable bushing.

Extra safety — exclusive throttle valve lock works like the safety on a gun — prevents accidents before they happen.

Easy riding — fast cutting action without violent recoil means less operator fatigue. Holding handles stay cool.

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Quick acting latch type steel retainer — holds tool securely.

Positive lubrication — integral oil reservoir meters oil to every working part, including tool shank. Lubricated shank reduces chuck wear and breakage of gads.

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B67



B87



Specifications for GARDNER-DENVER B37 PAVING BREAKER

Weight	38 lbs.
Piston Diameter	1 7/8"
Length	22"
Size of Tool Shank	1" Hex. x 4 1/4"
Air Hose	3/4"
Recommended Weight, Boxed for Shipment	61 lbs.
Boxed Dimensions	8" x 16" x 26"
	1.9 cu. ft.



GARDNER-DENVER

SINCE 1859

the *Personal Side* of the news

Special Assistant

E. W. (PAT) SMITH has been appointed special assistant to Ben S. Wright, general sales manager of Owens-Corning Fiberglas Corp., New



E. W. (Pat) Smith

York, N. Y., with headquarters in Toledo, Ohio. He was formerly vice-president of sales for Philip Carey Manufacturing Co., and previously served with Johns-Manville Corp. and Certain-teed Products Corp. Mr. Smith is president of the Asbestos-Cement Products Association, past chairman of the board of governors of the Asphalt Roofing Industry Bureau, a committeeman of the Producers' Council, and a director of the National Mineral Wool Association.

Director of Sales

DONALD WILLIAMS, general sales manager, The Dow Chemical Co., Midland, Mich., has been appointed director of sales to succeed Leland I. Doan, who has been elected president of the company, following the death of Dr. Willard H. Dow, in an airplane crash March 31. DONALD K. BALLMAN, former assistant general sales manager, will succeed Mr. Williams as general sales manager, and Dr. L. S. ROEHM will become assistant general sales manager, and will continue in charge of the technical service and development division.

Named Vice-President

HARRY A. REICHENBACH has been elected vice-president in charge of production for the Nazareth Cement Co., Nazareth, Penn. He has been in charge of production for several years. SCOTT BROBSTON has been named treasurer, and MISS IRENE E. HAWK, assistant secretary. They succeed Miss Charlotte F. Michael, assistant sec-

retary and acting treasurer, who has retired after 40 years of active service. WILLOUGHBY F. FOLLWEILER, plant superintendent, has retired after 41 years of service and will be succeeded by ERNEST WILKEN. J. Clifford Evans, chief chemist, is on leave of absence due to illness and his return to full activity is considered doubtful, so EDMUND C. MORGAN has been appointed acting chief chemist. Other officers of the company are M. J. Warner, chairman of the board of directors; H. B. Robeson, president; and M. P. Warner, vice-president in charge of sales.

Receives Award

FOSTER DEE SNELL, president, Foster D. Snell, Inc., New York, N. Y., consulting chemists and engineers, has been named by unanimous vote of the council of the Society of Chemical Industry, London, England, to receive the Society's Gold Medal for 1949. This medal is awarded bi-annually to a person "who has attained eminence in applied chemistry." It was first awarded in 1896 and had since been awarded to only one American, Prof. Ira Remsen of Johns Hopkins University in 1904. Dr. Snell will receive the medal at the Society's meeting at Manchester, England, July 13, 1949, when he will deliver an address on a phase of surface activity.

Named Vice-Presidents

CLARENCE L. LAUDE has been appointed vice-president in charge of sales for the Huron Portland Cement



Clarence L. Laude



M. Ripley Schemm

Co., Detroit, Mich., and H. RIPLEY SCHEMM has been named vice-president in charge of operations.

Magee Heads Alpha

J. F. MAGEE, vice-president of the Alpha Portland Cement Co., Easton, Penn., has been elected president of the company, to succeed F. G. McKelvy who has been made chairman of the board. G. S. BROWN, former board chairman, has been elected honorary chairman of the board. Other officers elected are F. M. Coogan, vice-president; R. S. Gerstell, vice-president; Howard Hanks, vice-president; J. J. Matthes, secretary and treasurer; F. G. Lyons, assistant secretary and assistant treasurer; and W. G. McKelvy, assistant secretary.

Joins Dolomite Firm

ROBERT L. MILLER, field engineer for the Portland Cement Association, Milwaukee, Wis., for the past 12 years, has become associated with Drummond Dolomite, Inc., Sheboygan, Wis., producer of limestone products for the steel, chemical and road building industries in the Great Lakes area. Mr. Miller will be engaged in the development of new sales markets and product engineering.

Elected Mayor

SIDNEY PURDY, bookkeeper for the Killbuck Sand and Gravel Co., Killbuck, Ohio, has been elected Mayor of the Village of Killbuck to fill the vacancy made by the resignation of J. Hubert Smith who has moved to Indianapolis, Ind. Mr. Purdy has been a member of the village council for the past year.

Director of Promotion

WILLIAM P. MARKERT has been appointed director of promotion of the National Concrete Masonry Association, Chicago, Ill. His duties will en-



William P. Markert

tail the preparation of merchandising and sales promotion material, as well as the editing of the monthly house organ. A native of Ishpeming, Mich., Mr. Markert studied French at the University of Illinois, and art and photography at the Institute of Design. After spending three years in the Army, he returned to graduate from Northwestern University in 1946.

Reelected President

G. A. AUSTIN has been reelected president of Consolidated Quarries Corp., Decatur, Ga. Also reelected were Nelson Severinghaus, vice-president and general manager; A. B. Kirkman, vice-president and sales manager; and K. D. Howington, secretary-treasurer.

Elected Directors

ALFRED S. OSBOURNE, director and member of the executive committee of Dravo Corp., Pittsburgh, Penn., and LOUIS A. MERTZ, director, vice-president and treasurer, have been elected directors of Dravo-Doyle Co., a subsidiary.

Ohio Highway Director

THEODORE J. KAUER, former assistant managing director of the American Concrete Pipe Association, Chicago, Ill., has been appointed director of highways by Governor Frank J. Lauche of Ohio, and will make his headquarters at Columbus. Mr. Kauer is a graduate civil engineer of the

Ohio State University. He was first employed by the Ohio Department of Highways as maintenance engineer, construction engineer and division engineer. He resigned to become airport paving engineer for the Civil Aeronautic Administration in Washington, D. C. Later he joined the American Concrete Pipe Association. Recently he was managing director of the Wire Reinforcement Institute. Mr. Kauer has served on several technical committees of the American Road Builders' Association, and as chairman of the Committee on Design, Rigid Type Pavements of A.R.B.A.

Visitors from France

H. COTTE, engineer, general manager of Balthazard & Cotte, Grenoble, France; J. PATY, general manager of Ste. Helfo, Wizernes, France, and P. NAIJON, assistant secretary of the Chambre Syndicale Nationale des Fabricants de Chaux Grasses, Paris, France, were recent visitors of ROCK PRODUCTS. Mr. Cotte's firm has four lime plants in France, specializing in the production of chemical lime. Mr. Paty is a manufacturer of lime and producer of crushed limestone in the Calais section, whose plant was bombed out of existence during the recent war by allied planes. Mr. Naijon is the assistant secretary of what corresponds to our National Lime Association. Messrs. Cotte and Paty are members of the board of directors. The three are visiting Canadian and American lime plants. In Chicago they inspected the plant of the Marblehead Lime Co. Their itinerary includes plants in Massachusetts, Ontario, Illinois, Missouri, Texas, Alabama, Ohio, Virginia and Pennsylvania.



Jack Merritt

Penn-Dixie Appointments

RUSS A. LOVELAND, research engineer for the Portland Cement Association, Chicago, Ill., has returned to the Pennsylvania-Dixie Cement Corp.,



Russ A. Loveland

Easton, Penn., as superintendent of Plant No. 4 at Nazareth. JOSEPH C. MCGRATH has been appointed superintendent of Plant No. 9 at West Winfield, and EVAN B. GUTH has been named chief chemist at that plant. Alfred Eli Carpenter has succeeded Mr. Guth as chief chemist of Plant No. 2 at Clinchfield, Ga. WALTER IRBY NUNEELE, JR., has been appointed assistant to the chemical engineer with headquarters at Nazareth.

Mr. Loveland started his career in the cement industry in 1920 as mix chemist at the Hanover, Mont., plant of the Three Forks Portland Cement Co. He left there a few months later to attend the University of Chicago, returning as assistant chemist in 1923, working alternately at the Hanover and Trident, Mont., plants. Two years later he became associated with the Clinchfield Portland Cement Co., Clinchfield, Ga., (now a part of Penn-Dixie) as assistant chemist. Subsequently, he joined the Dewey Portland Cement Co., Kansas City, Mo., serving as plant chemist, plant engineer, chief chemist and research engineer at the Dewey, Okla., and Davenport, Iowa, plants, from 1926 to 1944. Mr. Loveland relinquished this connection to accept a position as production manager for Cementos Portland Moctezuma, S. A., Cuernavaca, Morelos, Mexico. A year later he joined the Marquette Cement Manufacturing Co. as assistant to the technical director. From June, 1947, to the present time he has served the Portland Cement Association as research engineer in the manufacturing research section.

Mr. McGrath joined Penn-Dixie in 1946 as engineer-draftsman at the Portland Point, N. Y., plant. A year

OBITUARIES

later he was transferred to Clinchfield, Ga., in the same capacity. When Plant No. 9 was acquired in 1949, he was appointed plant engineer. A native of New York State, Mr. McGrath, upon graduation from Clarkson College of Technology in mechanical engineering, was employed for three years as shop superintendent for the New York Air Brake Co., and a year later was field engineer for the George A. Fuller Engineering Co.

Mr. Guth first entered the employ of Penn-Dixie in 1945 in the chemical laboratories at Plants 4 and 6. He received his technical training at Franklin and Marshall Academy and Lehigh University and has held positions in the chemical departments of the Universal Atlas Cement Co., Crescent Portland Cement Co., Keystone Cement Co., National Portland Cement Co., and prior to his connection with Penn-Dixie, with Vultee Aircraft Corp. as static test engineer.

Mr. Carpenter started in the cement industry with the Clinchfield Cement Co. at Kingsport, working up from physical tester through various grades in the chemical laboratory and with transfer to Clinchfield in 1943 as assistant chemist.

Mr. Nunnelee graduated from the Georgia Institute of Technology as chemical engineer, entering the cement industry at Rockmart, Ga., with Southern States Portland Cement Co. In 1943 he was employed as an assistant chemist at Clinchfield. Selective Service took him into the Army the following year with overseas duty during the next two-year period, following which he has been on special assignments in plant laboratories at Clinchfield, Kingsport, Richard City, Des Moines, and West Winfield. At the present time, he is assigned to conservation work at Plant No. 8.

Sales Appointments

JACK FEELEY has been appointed sales representative for the San Francisco and Peninsula area of the Standard Gypsum Co. of California, Oakland, Calif., and DICK CROWLE, formerly administrative assistant in the Oakland office, has been appointed to cover Sacramento Valley sales. Mr. Feeley was with the old Standard Gypsum Co. from 1927 to 1938, before it became a Henry J. Kaiser-operated organization in 1944. Mr. Crowle has been with the company since April, 1947.

Plant Manager

VINCENT E. WESSLES, formerly superintendent of the Petoskey Portland Cement Co., Petoskey, Mich., has been appointed manager of the Mobile, Ala., plant of Ideal Cement Co., Denver, Colo. HARLEY FLEMING, who has been with Ideal since the purchase of the plant, has been made superintendent.

C. NEAL BARNEY, vice-president, secretary and general counsel of Worthington Pump and Machinery Corp., New York, N. Y., passed away at his home in Scarsdale, N. Y., on April 24. He was 73 years of age. A native of Lynn, Mass., Mr. Barney was graduated from Tufts College in 1895 and took his law degree at Boston University, returning to Tufts for further post-graduate study. He joined Worthington as chief counsel and secretary in 1918, was appointed secretary-treasurer in 1932, and was elected vice-president and secretary in 1942.

ROBERT G. MILLER, retired operator of a sand and gravel business in East Corning, N. Y., died April 14 in Elmira, N. Y., at the age of 72.

RAYMOND A. MOONEY, district sales manager in the New York office of the Huron Portland Cement Co., Detroit, Mich., for the past 23 years, died in Buffalo, N. Y., on April 13, following a short illness. He was 59 years old.

JOHN F. KLEIST, JR., owner of the John F. Kleist Sand and Gravel Co., Milwaukee, Wis., died on April 20 at the age of 58. For 35 years he had been in charge of the firm, which was founded by his late father, John, Sr.

ANCIL ELDON LIERLY, superintendent of the Plainville, Ill., plant of the Missouri Gravel Co., Moline, Ill., died April 21 of injuries received when the automobile in which he was riding skidded on wet pavement and overturned. He was 37 years old.

WILLIAM EDGAR BUSBIN, assistant superintendent of loading at the Tyrone Rock Products Co., Tyrone, Ga., and former Georgia Tech football star, was killed instantly on April 25 when he was crushed beneath the wheels of a loaded railroad car while supervising loading operations at the plant. He was 23 years old. Mr. Busbin was a nephew of J. Francis Wilkerson, sales manager of the company.

J. F. MANNING, JR., president of the Rockwood Alabama Stone Co., Russellville, Ala., with offices in New York, N. Y., died March 16 at his home in Harrison, N. Y. He was 56 years old. Mr. Manning had been with the company for 20 years. His father, the late James F. Manning, Sr., had preceded him as president of the firm.

FRANK T. FITZGERALD, president of the Amite Sand and Gravel Co., Alexandria, La., and his 8-year-old daughter, Geraldine Elizabeth, were killed March 12 in an automobile accident at Willow Glen, a suburb of Alexandria. Mrs. Fitzgerald and a son, Frankie, 10 years old, were seriously injured. Mr. Fitzgerald was 41 years old.

M. JAMES RUGGIERO, president of the Acme Sand and Gravel Co., Woburn, Mass., died on March 11 at his home in Watertown, Mass.

CHARLES H. WILLIAMS, owner and operator of the Williams Sand and Gravel Co., Dallas, Texas, died March 30.

MRS. CLARA STUEWE, wife of Waldemar Stuewe, vice-president of the Central Ready Mixed Concrete Co., Milwaukee, Wis., collapsed March 30 while she was shopping and died before an ambulance could take her to the emergency hospital.

MERRYL L. MCCARTHY, secretary-treasurer of the Rock Hill Quarries Co., St. Louis, Mo., passed away February 27. He was 51 years of age.

ROBERT W. GARTSIDE, who had been a sales representative for the Glencoe Lime and Cement Co., St. Louis, Mo., before his retirement some years ago, died March 25.

THOMAS F. BAKER, a salesman for the Fischer Lime and Cement Co., Memphis, Tenn., died suddenly on April 5. He was 44 years old.

WALDEN W. PAAPE, domestic sales manager of The Euclid Road Machinery Co., Cleveland, Ohio, died suddenly on March 18 at his home in Willoughby, Ohio. He was 48 years of age. Mr. Paape had been identified with the construction industry for the past 25 years. He joined the company in 1945 as district manager and was appointed domestic sales manager in 1947. He had previously served in executive sales capacities for LaPlant-Choate Mfg. Co. and Caterpillar Tractor Co., also as sales manager for the Syracuse Supply Co.

GUSTAF A. CARLSON, who with his brother, Frank, organized the concrete block and tile company known as Carlson Brothers in St. Peter, Minn., died recently at his home after an illness of six months. Mr. Carlson and his brother operated the firm for 46 years, selling it in 1948 to Ed Drenttel and Albin Nelson.

ISAAC E. BARTLETT, former safety engineer at the Iola, Kans., plant of the Lehigh Portland Cement Co., Allentown, Penn., died January 6. He was 88 years old.

C. W. HINER, district engineer of the Omaha, Nebr., office of the Portland Cement Association for the past eight years, died suddenly at his home in Lincoln, on April 11. Mr. Hiner had been with the Association for 21 years.

RUSSELL B. MAYES, operating engineer for the Pfaff and Smith Builders' Supply Co., Charleston, W. Va., died April 13. He had been associated with the company for 19 years.

JOHN C. BECKER, retired superintendent of the Sewer Pipe Co., St. Mary's, Penn., died April 18 at his home in Canton, Ohio, where he had gone to live following his retirement 18 months ago. Prior to his 25 years' association with the pipe concern, Mr. Becker had been superintendent of the Robinson Clay Products Co., Akron, Ohio, for 13 years.

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INDUSTRY *News*

Uphold County Ruling in Cement Case

THE SUPREME COURT recently confirmed a decision by Judge Paul H. Heinz of the Shawnee county, Kan., district court who set aside an order by the State Corporation commission in the cement rates case affecting carrier movements within the state by all Kansas railroads. Both courts held that the commission issued an order which was broader than the scope of investigation outlined in the notices to the carriers. In January, 1945, the commission began an investigation into rail freight rates on cement between producing points and points of delivery in the western two-thirds of the state.

Following a hearing in March of that year the commission issued an order and defined regulations broader than outlined in the notice of investigation. The regulatory body held that the carriers had failed to show cause for not directing a reduction in the freight rates on cement. The railroads appealed to the District court which ruled that the commission's order was illegal. The commission then appealed to the Supreme court and that tribunal upheld the order of the lower court.

Potash Plant Improvement

POTASH CO. OF AMERICA, Carlsbad, N. M., is completing a \$4,000,000 expansion and improvement program started early in 1948 and expects to increase its output of refined products by 50 percent. Improvements include: a 26-mile pipe line for fresh water supply; addition of two large grinding mills; a new Symons cone crusher; six new cooling agitator plants; a new 24-cell flotation section; a new 1000-hp. hoist, and new all-steel rotary dump cars.

Ban Dredging Activities

GOV. FRANK J. LAUSCHE of Ohio has placed a ban on any further dredging activities in the Fairport Harbor and the Loraine-Vermillion areas after this year. The two sand beds are said to be the largest on Lake Erie. Dredging companies have been notified that no sand will be taken from the two beds next year, and that the amount to be dredged this year has been restricted to 175,000 tons—75,000 from the Fairport area

and 100,000 from the Loraine-Vermillion area. Companies affected are The Kelley Island Lime and Transport Co., Schwartz Sand and Gravel Co. and Erie Sand and Gravel Co.

Establish Slag Plant

STEELTON FOAM SLAG CORP. has set up a plant at Steelton, Penn., for the production of lightweight expanded slag in both coarse and fine grades. The screened coarse size will be $\frac{1}{2}$ to $\frac{3}{4}$ in., the fine size will be from $\frac{1}{4}$ in. to dust, and plant equipment will allow any mixture of either size in the same shipment. Richard T. Gumpert is president of the corporation, which has offices in Baltimore, Md., and L. J. Peters is secretary-treasurer.

Purchase Quarry

WARD KRUDWIG and J. E. BOSWELL have announced purchase of the Stony Point Quarry near Phillipsburg, Mo., from the Stony Point Quarry Corp. To be operated by a corporation, the quarry now will be known as Rock Point Quarry. Agricultural limestone, chips for driveways and crushed stone for concrete work will be sold.

Vermiculite Plant in Oregon

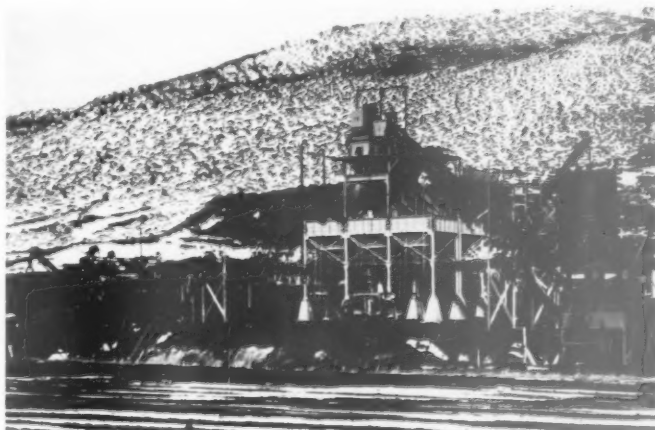
ZONOLITE Co., Chicago, Ill., has announced that the Northwest Insulations Co., Portland, Ore., has opened a new vermiculite-processing plant. Northwest also operates a vermiculite processing plant in Spokane. These plants are in addition to one run by Zonolite in Libby, Mont., site of Zonolite's mines. The factory, which will include 10,000 sq. ft. of floor space, will be remodeled and equipped for expansion of vermiculite at a cost of \$75,000. Leo Hall will be manager of the Portland Division.

Cement Company Expands

PENNSYLVANIA-DIXIE CEMENT CORP., New York, N. Y., has purchased assets of the West Penn Cement Co., including a plant at West Winfield, Penn., with annual capacity of approximately 1,400,000 bbl.

Sand and Gravel Plant

PAUL WALLACH has set up a sand and gravel operation near Eunice, N. M., which has a capacity of approximately 210 cu. yd. per day.



Ralph Rogers and Co., Inc., Bloomington, Ind., has set up a crushing plant at the west face of North Table Mountain, near Golden, Colo. The rock, a blue basaltic granite, is being furnished for the construction of two new dams in Burlington, Colo., and western Nebraska respectively. The contract calls for riprap stone and concrete aggregate.

Lightweight Aggregates Plant to Open

GREAT LAKES CARBON CORP., New York, N. Y., has announced that it expects its large modern Permalite processing plant in Linden, N. J., to be in operation early in July. T. C. Carter, corporation vice-president and general manager of the Building Products Division, estimates that output of the new plant will be about 75 tons per day of the lightweight plaster and concrete aggregate. Facilities will consist of a 70- x 165-ft. main building, an addition 20 x 100 ft., and the kiln, crude storage bins and silos. The company also operates a processing plant in Torrance, Calif.

Cement from Mexico

THE MEXICAN GOVERNMENT has made plans to ship 1,000,000 tons of cement to the United States shortly. The shipment, all contracted for and the largest of its kind ever to be made, is said to result from lifting of a government ban imposed to keep Mexican cement within the country.

Find Fluorspar Deposit

THE PMT Co., a newly organized mining group which has sub-leased about 40 acres of land in Pope County, Ill., from the Hicks Creed Mining Corp., has reported discovery of a vein of fluorspar described as one of the best found in the Kentucky-Illinois district in recent months. Core-drilling has revealed the vein to be from 8 to 18 ft. wide. Two new shafts 140 and 125 ft. have been sunk. C. T. Cochran, M. L. Conn and Ted Joiner are partners in the new operation.

Village Council to Buy Gravel Pit

THE ELBOW LAKE, MINN., Village Council has announced plans to purchase a plot of land containing a deposit of high-grade gravel. Materials produced will be used for street improvement.

Ganister Quarry

HARRISON-WALKER REFRACTORIES Co. is mechanizing a ganister quarry and setting up a crushing and washing plant at Mt. Union, Penn., to replace present operations which, to date, have employed hand sizing and loading methods.

In the quarry, rock will be drilled and blasted on a bench system, and loaded by 2½-cu. yd. power shovels into 15-ton trucks for delivery to the crushing plant. Rock up to 3½ ft. in size will be fed to a large jaw crusher, then be re-crushed by a gyratory crusher, and be reduced to 1½-in. size

in a cone crusher. A picking belt between the primary and secondary crushers is being provided for removing hard pieces of off-color rock. From the crushing plant, the rock will be conveyed by belt conveyor to bins in the washing plant.

In the washing plant, the rock will be treated by methods said to be completely new for the processing of ganister rock to be used for the manufacture of silica brick. The crushed rock and water will be fed into a large cylindrical revolving "scrubber" where the pieces of hard ganister will grind the soft foreign materials into fines which can then be washed out. Washed ganister will be conveyed to stockpiles where 60,000 tons can be stored for use during freezing weather when the washing plant will not be operated. A 1200-ft. conveyor belt running in a tunnel under the stockpile will deliver the material to the plant.

Halt Blasting Operations

BLASTING OPERATIONS by Storms-Frew Construction Co. in a Kansas City, Mo., quarry were curtailed and then halted when residents in the neighborhood complained of the work. The firm plans to remove all loose rock to a site 650 ft. south of the present quarry where blasting will be continued. The rock is being used for river dike construction.

Sand and Gravel Plant

A. ZALZNECK AND SON has started construction of a sand and gravel plant at North Corry, Penn., where the firm's ready-mixed concrete operations also will be located.

Portland Cement Production

PRODUCTION of finished portland cement in February, 1949, totaled 13,751,000 bbl., an increase of 3 percent over production reported for February, 1948, Bureau of Mines reports. Mill shipments totaled 9,134,000 bbl., an increase of 10 percent over the February, 1948, figure, while stocks of 22,208,000 bbl. on February 28, 1949, were 9 percent above the February, 1948, totals. Clinker output in February of this year amounted to 15,113,000 bbl., representing an increase of 5 percent over the corresponding month of 1948.

Produces Pumice Aggregate

DESERT MATERIALS CORP., Los Angeles, Calif., has announced purchase of the assets of Paul R. Splane, Inc., pioneer in the development of pumice as a lightweight aggregate for concrete construction. The new firm exercised its option to buy and operate all pumice deposits controlled by the Splane firm and is in full production. H. H. Fogwell is president of Desert Materials Corp.

Correction Item

ON PAGE 100 of the April, 1949, issue of ROCK PRODUCTS the third paragraph called (b) should read "The use of ½-in. slump concrete to be placed by vibration, replacing the 2-3-in. or higher slump concrete in use." The kind of compaction advocated would not be suitable for use with the 1½-in. slump concrete, indicated in the article, but would require a much drier mix.

Coming Conventions

June 27-July 1, 1949—

American Society for Testing Materials, 52nd Annual Meeting, Hotel Chalfonte-Haddon Hall, Atlantic City, N. J.

October 10-14, 1949—

American Society for Testing Materials, 1st National West Coast Meeting, Fairmont Hotel, San Francisco, Calif.

October 24-28, 1949—

37th National Safety Congress and Exposition, Chicago, Ill.

January 22, 1950—

National Sand and Gravel Association, 34th Annual Convention and Exhibit, Stevens Hotel, Chicago, Ill.

Week of

January 22, 1950—

National Ready Mixed Concrete Association, 20th Annual Convention and Exhibit, Stevens Hotel, Chicago, Ill.

Week of

January 29, 1950—

National Crushed Stone Association, 33rd Annual Convention and Exhibit, Stevens Hotel, Chicago, Ill.

Provisions in Agricultural Appropriation Bill

THE AGRICULTURAL APPROPRIATION BILL (H.R. 3997) has been passed by the House of Representatives with the following provisions of immediate and direct interest to producers of agricultural limestone, according to a letter from the Agricultural Limestone Institute:

(1) A change in the wording of the bill so that money appropriated for "soil-building practices and soil- and water-conserving practices" can be used for that purpose only.

(2) An appropriation of \$257,043,439 to finance the 1949 Agricultural Conservation Program — a figure which was arrived at by deducting \$5,456,561 (in the main representing the cost of administering acreage allotments for peanuts and tobacco) from the total of \$262,500,000 requested by President Truman and his Budget Bureau for both allotments and conservation.

(3) An authorization of \$262,500,000 for the 1950 Agricultural Conservation Program, which was obtained by deducting \$37,500,000 (the estimated cost mainly of administering 1950 acreage allotments and marketing quotas) from the request of President Truman and his Budget Bureau for \$300,000,000 for both purposes.

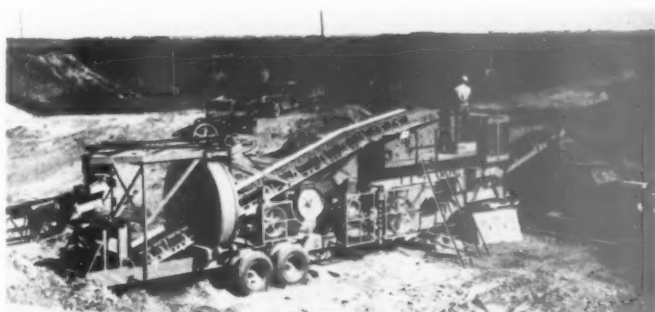
(5) An increase in the present maximum of \$750, that can be paid to any participant in the Agricultural Conservation Program, to \$2500.

Gypsum Production

MINE PRODUCTION of crude gypsum during 1948 reached 7,044,447 tons, according to the Bureau of Mines. This was nearly one million tons above the previous record of 1947. Imports amounted to a total of 2,859,209 short tons, also a new record, making the apparent supply 19 percent above 1947. Extensive modernization of existing facilities and expansion of capacity in response to heavy demand have made the record production figures possible. During 1948, most of the gypsum plants were operated near capacity, and it is anticipated that demand for gypsum products will remain strong during 1949.

Cement Company Expansion Program

GENERAL PORTLAND CEMENT CO., Chicago, Ill., reports that a two-year expansion and improvement program now nearing completion has increased its annual cement producing capacity by approximately 2,265,000 bbl. at a cost of nearly \$4,000,000. This increase, which raised the total annual productive capacity from 6,635,000 bbl. at the beginning of 1947 to



Conrad Peterson is operating a Universal TwinDual Master 24 portable gravel plant at Canby, Minn., producing road gravel. The plant has a 10- x 24-in. roller bearing jaw crusher, 24-in. TwinDual rolls, a 3- x 8-ft., 2½-deck gyrating screen, and is powered by a 100-hp. diesel engine. A swivel drive field conveyor is used for loading, so that a large pit area may be worked without moving the main plant. Capacity is 150-200 cu. yd. of minus 1-in. gravel per hr.

approximately 8,900,000 bbl. early in 1949, has contributed substantially to increased earnings, Smith W. Storey, president, pointed out in a letter to stockholders.

Net profit for the year 1948 totaled \$4,273,000, an increase of 62 percent over the 1947 profit of \$2,637,000, which, based on 1,012,800 shares of common stock outstanding, equalled \$4.21 per share in 1948, compared with \$2.60 per share in 1947. Net sales for the year 1948 totaled \$19,491,000 as against net sales of \$14,724,600 in 1947.

Approximately \$1,600,000 was spent last year on the company's improvement program. Further expenditures to amount to around \$1,100,000, principally for the improvement of properties and efficiency in operation, are planned for 1949, Mr. Storey stated.

To Build Cement Plant at Palm Springs

SAMUEL A. GUIBERSON, after an 8-month delay over zoning laws, has been granted the right to establish a cement mill on a site five miles west of the Palm Springs desert resort, and has signed a contract for construction of a \$15,000,000 plant which will have a capacity of approximately 10,000 bbl. per day. Mr. Guiberson, who has owned the property for 25 years, said the new plant should be in operation in about a year. Core drilling exploration has revealed the presence of 25,000,000 tons of limestone at the site. Some local officials in this California resort plan to continue opposing the plant, however, stating that it would be a health hazard.

Erratum

IN THE GRAPH appearing on page 122 of the April, 1949, issue of ROCK PRODUCTS, the bottom scale should be "Induced Draft" and should read in units of 1.0, 2.0, etc., instead of 10, 20, etc.

Plans New Limestone Processing Plant

SOLVAY PROCESS DIVISION, Allied Chemical & Dye Corp., may construct a processing plant close to limestone deposits at Chaumont, N. Y., and transfer some of its activities from the town of Camillus in Onondaga county to the Chaumont area by reason of chemical sludge-disposal restrictions recently set up by Camillus authorities.

Pending a satisfactory determination of the Camillus situation the Solvay Division, under the management of Carlton Bates, has suspended orders for equipment designated for its plant expansion program in the town of Camillus.

For 25 years the company has owned 1000 acres of lime rock land along the Chamont river between the villages of Chamont and Depauville. After the Solvay company purchased title to these lands it was decided not to quarry and ship the rock to Solvay because of shipping costs. However, it is now pointed out that the company might regard the Chamont river area as a favorable site for a processing plant, providing a satisfactory arrangement for sludge disposal can be worked out.

Lime Plant Expansion

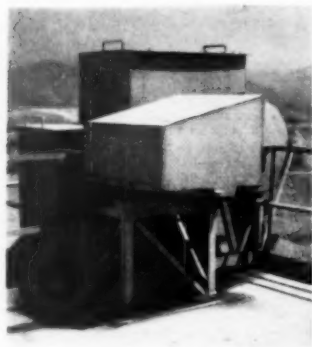
LONGVIEW SAGINAW LIME WORKS, INC., Birmingham, Ala., has placed a new Azbe kiln in operation. The plant now has four older small kilns remodeled to the Azbe system, and two larger new kilns which, altogether, have a daily capacity of 300 tons of burned lime from high calcium stone. Several years ago the four original kilns produced only 70 t.p.d. Future plans call for further refinement of quarry operations, modernization of the hydrating plant, a small stone kiln, and another large kiln. Warren Lewis is president of the corporation, and E. M. Snow is plant manager.

HINTS *and* HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Motor Housing

THE MOTOR HOUSING and arrangement of the discharge end of a bucket elevator installation, shown in the photograph, not only are neat looking,



Motor housing assembled on a bucket elevator

but are found to be especially serviceable at an operation in California. Attention is called to the covers with convenient handles that are the top of the bucket elevator and at the discharge chute.

Truck Cable for Steep Quarry Roads

AS PIT-TYPE QUARRIES get deeper and deeper, the problem of getting supplies and heavy equipment to the bottom grows. There are many quarries where all shovel parts, truck and drill items must be lowered over the rim with a suitable stiff leg derrick or crane. At the quarry illustrated, the



Winch and cable enables truck to travel steep grade

gradient was very steep where the truck is descending, as can be seen by the stairway at the right. It would appear that the truck has a special type low drive to travel this steep grade. This is accomplished however, by a steel cable fastened to the rear assembly of the truck. A winch at the top of the road lowers and helps pull the truck from the quarry.

Drop Ball Breaks Stone

A DROP BALL is being used for breaking rock at a large dimension stone quarry in North Carolina. Any rejected or angular pieces are broken up by the drop ball and the material is processed for chicken grits and aggregate. Impact of the unusually large drop ball causes the top of the quarry to quiver. One of the reasons for this



Drop ball at moment of impact

is that the foundation stone under the drop ball, for an acre or more in extent, previously had been "lifted" so that it essentially is a huge slab of granite over which the railroad track has been laid from which the steam lift crane is operated. The only break in this slab is a horizontal seam where the slab had been lifted. It gives the impact a hollow sound.

Suction Pump Screen

AT THE NEW PLANT of the Kern Rock Co., near Bakersfield, Calif., water is pumped to the plant by an 8-in., two-stage, Byron Jackson centrifugal pump that delivers to a 12-in. spiral steel pipe roughly 2 miles long. Water is taken from the Kern River. When it was desired to place the suction end of the pipe further out in the stream, and at the same time overcome the difficulties caused by stray



Lowering screen and foot valve unit to its place in river

leaves and twigs, the operators welded $\frac{1}{4}$ -in. wire cloth around the foot valve. Its size approximated that of an ordinary oil barrel. After being fabricated on the edge of the stream, the unit was lowered with a suitable crane and bolted into place.

Drag Scraper Takes Dust From Kiln Chamber

AT CAROLINAS CEMENT AND LIME Co., Harleysville, S. C., producer of agricultural limestone, a high calcium marl or unconsolidated limestone material is dried in an 8-ft. dia. rotary dryer before shipping. The dryer, formerly a rotary cooler in a cement plant, is home-made. The operators



Dust collection system

HINTS AND HELPS

welded an end section to the unit so that it now is 90-ft. long. It is driven by a 75-hp. motor through a Falk reduction unit.

At the high end of the kiln, a brick dust chamber has been built which works in conjunction with two cyclone collectors. The coned discharge end of one of these cyclones can be seen in the illustration discharging to an off-bearing conveyor. Dust in the bricked settling chamber is removed by a home-made drag assembled from an old heavy duty bucket elevator chain. This chain drag extends across the bottom of the dust chamber and runs in a horizontal position, discharging to the same conveyor serving the cyclone collectors. The arrow in the illustration points to the channel iron housing in which the loaded part of the drag rides. Immediately below it is the return chain.

It was suggested that this system be used to blend wet sand to a belt conveyor as it is a simple unloader that can be made to deliver a uniform amount without arching troubles.

Sand Dewaterer

AT CLARK'S HILL DAM on the Savannah river in Georgia, sand is being produced with a Marcy rod mill from minus $\frac{3}{4}$ -in. granite screenings, and goes to a Dorr bowl rake de-waterer. The two rakes on the de-waterer have been shortened at the discharge end approximately 3 ft. The first cross-flight of each rake is a grid-like member, is perforated and is much larger in cross section than the other rakes on the unit. Thus in operation a large amount of sand is always in accumulation at the discharge rim, remaining there during several strokes of the rakes. This gives the sand time to drain more of its water content back into the de-waterer, and be delivered in a much drier state.



Sand dewaterer with shortened rakes. Note heavy bank of sand in front of the upper end of each rake

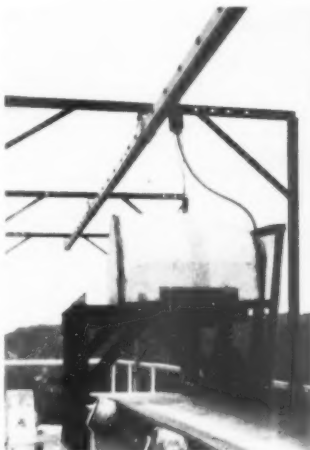


Block being cured under tarpaulin. Portable steam plant is in foreground

Housing for Lead Wires

LIME PRODUCTS CO., Cleburne, Texas, operates a shuttle conveyor driven by traveling controls that are

mental. In the illustration, 6000 block are under the canvas. Perforated steam pipes are located on the ground, with steam being supplied by the portable Hydropressure steam plant in the foreground. This type of steam generator also is being used for cleaning trucks, and other equipment.



Protection for lead wires to shuttle belt conveyor motor

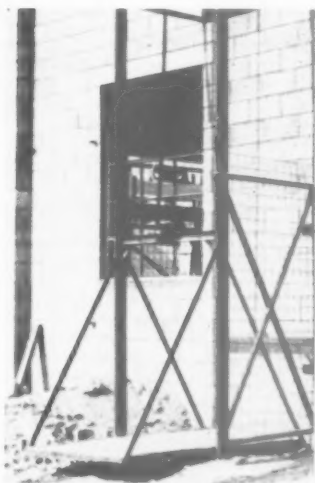
protected as shown in the illustration. Although this is coming to be standard equipment, shuttle conveyors often are found with the motor being driven by wire cable leads that tangle about the immediate premises.

Block Curing

A GREAT NUMBER of block plants in the Southwest depend upon open air curing, allowing the units to remain in the open for as long as 30 days or more. At one operation, however, curing is being done under a heavy tarpaulin. The system, necessitated by heavy sales, is temporary and experi-

Reject Block Elevator

AT A MODERN concrete block plant in North Carolina a platform-type elevator has been provided so that any inferior block coming from the machines can be wheeled to the platform and elevated to the mixing section. The elevator also could be used for sending sacked cement, coloring materials, puzzolona or other additives to the top of the structure, and even for elevating personnel, if necessary.



Platform-type elevator for elevating block

New Machinery

**ROCK
PRODUCTS**

Tire Repair

GOODYEAR TIRE & RUBBER CO., Akron, Ohio, has developed a new method of repairing injuries to off-the-

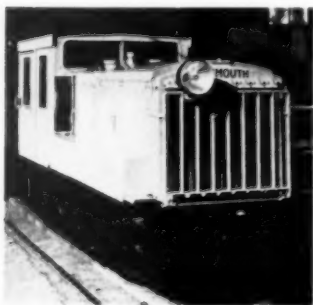


Device for repairing tire injuries without removing the tire

road tires that penetrate only a few of the tire's plies. Through this process, injuries not extending too deeply into the tire may be repaired quickly and easily, without removing the tire from the vehicle, the manufacturer states. This is accomplished with a light, portable hot air blower or vulcanizer, the Schlegel Air-Welder, electrically operated, that vulcanizes a special rubber into the injury without physical pressure. Curing time normally is from one to three hours.

Low-Cab Locomotive

PLYMOUTH LOCOMOTIVE WORKS, Plymouth, Ohio, has developed a new low-cab locomotive engineered to give the operator extra and unobstructed



Low-cab locomotive designed for extra visibility

vision. According to the manufacturer, design of the power unit in the 10-ton diesel locomotive has not been changed, but many extra features have been included for operating ease and efficiency. The 24-in. gauge locomotive is the first low cab type to be manufactured by the company.

Belt Conveyor

INDUSTRIAL ENGINEERING & MANUFACTURING CO., INC., Brimfield, Ind., is manufacturing a belt conveyor featuring versatility of design. According to the company, by adding sections and belting, the Universal industrial conveyor can be made in any length required, and can be furnished in any width, equipped to operate at any speed. With the addition of sideboards, it will convey stone, sand or aggregates. The unit is available with wheels for mobile use. The conveyor may be powered by either electric motor or gasoline engine. Motor and

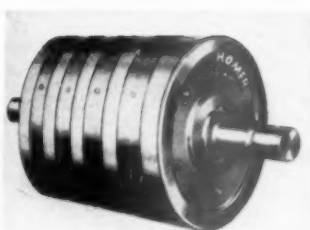


Adjustable belt conveyor

driving unit are mounted inside the formed steel sides, and are accessible through an opening in the bottom of the conveyor.

'Non-Electric' Permanent Magnetic Pulley

THE HOMER MANUFACTURING CO., INC., Lima, Ohio, has announced the new Power-Plus "non-electric" permanent magnetic pulley which it claims will equal or exceed the performance of electro magnetic pulleys of the same size and capacity. The pulley is designed to be used as either a head or idler pulley in belt conveyor systems, and is furnished in 57 standard sizes—in diameters of 12, 15, 18, 20, 24 and 30 in.—with belt widths ranging from 4 to 60 in. The units are crowned to prevent belt weaving and runout and to assist in equalizing the conveyed material as it passes over the pulley, according to the manufacturer. Standard or special length shafts are available to fit new or ex-

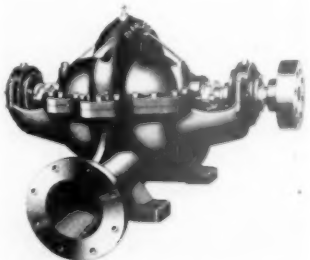


Permanent magnetic pulley requiring no outside power source

isting applications without changing bearings or shaft mountings. Head plates of cast aluminum are said to eliminate the piling up of magnetic material on the outer edges of the pulley.

Horizontal Centrifugal Pumps

PEERLESS PUMP DIVISION, FOOD MACHINERY AND CHEMICAL CORP., Los Angeles, Calif., has announced a line of horizontal centrifugal pumps designed for the general purpose of pumping water and alkaline fluids at temperatures up to 300 deg. F. The line of pumps, designated as Peerless Type A, has a wide capacity range up to 60,000 g.p.m. and is of single stage, double suction, split case design, and is available in sizes from 1½-in. through 38 in. All types of drives may be employed, the manufacturer states, including direct-connected electric motor, diesel, natural gas and gasoline engines, belted drives, steam turbine and combinations. Type A pumps are regularly furnished in cast iron, but may be obtained in steel, bronze or



Double suction, single stage, horizontal centrifugal general purpose pump as seen from discharge side

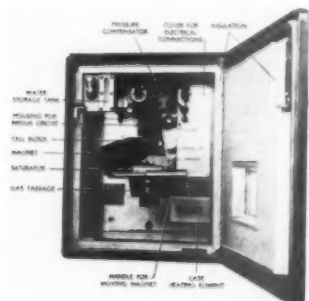
other alloys. Other features listed by the firm include the ability to inspect or remove the upper case and rotating element without disturbing pump alignment or piping connections; provision of water seal pipe to the stuffing boxes, air vents and lifting eyes; and drain plugs in the lower half of the case. Impeller wearing rings, case wearing rings and shaft sleeves are employed, and grease lubricated ball bearings are provided.

Earth-Shock Acceleration Detector Perfected

GENERAL ELECTRIC Co., Special Products Division, Schenectady, N. Y., has announced the "earth-shock acceleration detector" which measures the intensity of explosion shock waves passing through the earth. The new device, about the size of a small tin can, is designed so that it can be buried near the scene of test explosions, enabling engineers to determine the underground velocity and acceleration of shock waves caused, for example, by use of high explosives on large construction projects. The instrument can register shocks up to 1500 times the force of gravity, and as many as 10,000 impulses per second.

Oxygen Meter

THE HAYS CORP., Michigan City, Ind., is in production on the Hays Magno-Therm Oxygen meter which is said to operate on an entirely new principle based on the paramagnetic property of oxygen. It continuously analyzes, indicates and records the percentage of oxygen in boiler flue gases and in industrial gases, the manufacturer states. Gas to be analyzed is passed through a cell block in which there are two cells containing heated resistors. The sample gas diffuses into both cells. A strong magnetic field from a permanent magnet is directed across one resistor in the measuring cell. The oxygen bearing gas is attracted into the magnetic field (oxygen is paramagnetic) and be-



Meter for analyzing and recording percentage of oxygen in industrial gases



Rotary screen loader that separates sand and gravel as it digs and loads into trucks

comes heated by the hot resistor. The oxygen loses its magnetism as it becomes heated and is forced out of the magnetic field by the cooler and more magnetic oxygen. The cooling effect on the heated resistor is proportional to the magnetism of the gas entering the cell. This changes its electrical resistance and increases the flow of current through it. The change in flow of current is compared with the flow of current in the comparison cell resistor (without a magnetic field) and the difference in resistance is measured by a Hays Acatron electronic type recorder, calibrated to read in percent oxygen.

Rotary Screen Loader

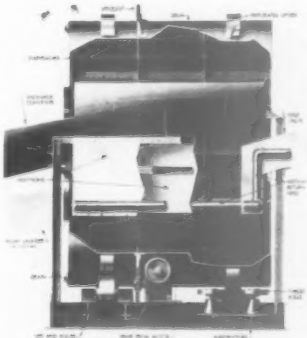
N. P. NELSON IRON WORKS, Clifton, N. J., is manufacturing an automatic rotary screen loader that separates sand and gravel as it digs and loads into trucks. The company describes the unit, which features one-man operation, as consisting of a rotary screen mounted on a self-powered Model Q-10 heavy duty bucket loader. The screen is constructed of steel plate channel framing and abrasion-resisting wire screen mesh, and in operation is synchronized with the bucket conveyor of the loader. Two chutes at right angles direct the flow of separated materials. When digging and loading materials that do not require screening, a throw-out clutch enables the operator to disengage the screen and deflect material through the lower chute. The rotary screen also handles damp and clinging sand. Screening capacity of dry mixtures ranges from 1 to 2 cu. yd. per min., depending on the size of the screen openings and the mixture of the material.

The bucket loader features a steel-toothed feeder that picks before it shovels. It is engineered to dislodge the material and spiral it into the buckets. The company also reports that braced struts, pivoted on the

frame of the loader chassis, keep the screen rigid whether in operating position or in lowered or traveling position. Size of the screen is 3 ft., 4 in. dia. and 4 ft., 10 in. length. Standard screen opening sizes are $\frac{1}{2}$, $\frac{3}{4}$ and 1 in. square. Weight of the screen assembly is approximately 1800 lb., and weight of the loader is approximately 14,500 lb.

Drum Separator

WESTERN MACHINERY CO., San Francisco, Calif., has added a drum separator to its line of equipment for heavy media separation. The Wemco Drum Separator has been specifically developed to meet increasing demand for a HMS separatory vessel that will treat coarse material, the manufacturer states. The unit will treat particle sizes ranging up to 8 in., in capacities up to 420 t.p.h., depending on the size units used. These are available in ten sizes from 6 to 14 ft., measured according to the outside diameter of the drum, and each unit is manufactured in two lengths.



Drum separator will treat particle sizes to 8 in.

NEW MACHINERY

High-Traction Tire

B. F. GOODRICH Co., Akron, Ohio, is manufacturing the Rock-Logger tire for use both off-the-road and on the highway. The tire, which features a

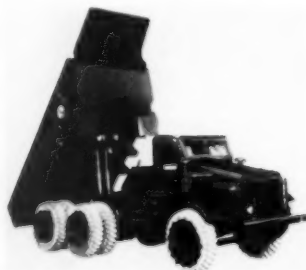


Off-the-road and on the highway tire

special casing, is said to make easy steering possible, and is valuable on front wheels of many trucks now carrying super-traction tires on rear wheels.

Rear-Dump Truck With Planetary Drive

THE EUCLID ROAD MACHINERY Co., Cleveland, Ohio, has announced the Model FFD Rear-Dump Euclid. The new model is powered by two diesel engines, mounted side by side, of 190 hp. each. Each engine drives one rear axle through a torque converter and torqmatic transmission, thus eliminating the conventional inter-axle power divider, the company states. There is no clutch pedal or manual shifting of gears. Top speed with full 68,000-lb. payload is 25.4 m.p.h. Two planetary drive axles, with reductions at each wheel, are mounted on free floating springs. Other features listed by the

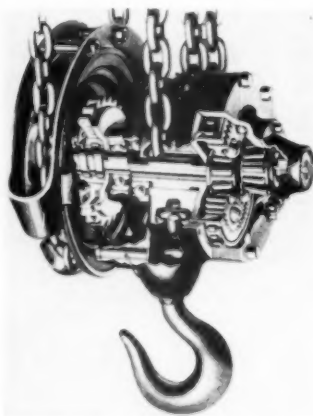


Tandem axle rear-dump unit

manufacturer are improved steering geometry, hydraulic booster steering, and steering brakes on the drive wheels to permit short turns.

Heavy-Duty Hoist

DAVID ROUND & SON, Cleveland, Ohio, has announced a complete new line of Auto-Bloc lightweight, heavy-duty hoists which feature a simplified hoisting mechanism, employing only two gears. The gears are a cam actuated floating inner gear and an outer gear to which the load sheave is rigidly connected. Each pull on the hand chain causes the cam shaft to revolve, actuating the floating inner gear. The inner gear moves eccentrically over the inner circumference of the outer gear; but, held in one position relatively by 8 hardened steel balls, it cannot rotate. It thus compels movement of the outer gear and load sheave, the company states. Gears



Cutaway view of hoisting mechanism

are of special alloy steel, cut, hardened and ground. The Auto-Bloc cover is unbreakable, drop-forged from chrome manganese steel with a tensile strength of 200,000 p.s.i. The units are available in 16 standard models of 1/2- to 40-ton capacity.

Uranium Detector

RADIATION COUNTER LABORATORIES, Inc., Chicago, Ill., announces the RCL Atomic Blinker for detection of uranium. Pocket size, the instrument has a light which blinks rapidly if radioactivity is present.

Shovel Loader

TRACTOMOTIVE CORP., Deerfield, Ill., has developed a materials handling loader, the TL-W Tracto-Loader, which has a 1/2-cu. yd. standard



Materials handling loader

bucket. The machine is mounted on rubber tires and has the bucket over the driving wheels, and the steering wheels in the rear for better traction and easier steering. Overall length is 12 ft. with bucket down, and width is 5 ft., 9 in. The hydraulically-controlled bucket picks up the load through forward crowding action and automatic "tilt-back," the company reports.

Hydrostatic Precipitator

AMERICAN AIR FILTER Co., Inc., Louisville, Ky., has re-designed its Type N Roto-Clone to permit wider application and improved performance in dust collection and control. The unit is a hydrostatic precipitator that cleans the air by the combined action of centrifugal force and an inter-mixing of water and dust-laden air. Water is re-used without recirculation pumps or spray nozzles. The Roto-Clone, with capacities up to 48,000 c.f.m., maintains a lower pressure drop with the same cleaning efficiency and water recirculation rate and can be operated from 50 to 120 percent of its nominal rating without affecting its collecting efficiency, the manufacturer states. All sizes are available in either manual clean-out, sludge ejector or hopper bottom arrangement.



Re-designed hydrostatic precipitator

Convertible Power Shovel

THE OSGOOD Co., Marion, Ohio, has redesigned its Type 72, 1 $\frac{1}{4}$ -cu. yd. excavator which has interchangeable



Materials handling unit for clamshell, crane and dragline work

features. Three models are available: 720, a shovel, dragline, clamshell, crane or hoe, with all front end attachments interchangeable; 725, mobile-crane, and 727, dragline, clamshell or crane. Improvements include a new type crawler unit with each tread belt independently controlled, and the addition of hook rollers. Other features listed are the Osgood air control, patented "air-cushion" clutches for applying metered air pressure to working parts smoothly; and a rotary coupling that takes air pressure down through the vertical travel shaft to the steering clutches and brakes without twisting or straining air pipes.

Protective Shield

GENERAL SCIENTIFIC EQUIPMENT Co., Philadelphia, Penn., has developed a face shield designed to give all-



Face shield with plastic visor

round face protection in welding and similar operations. The head gear is made of extruded plastic and fitted with a sweat band and pivot assembly. The visor is of fire repellent, flexible, clear Plastacel, available in varying depths, three thicknesses and three shades of green. All visors are 11 in. wide and have a wire reinforced gimp binding.

Vibrating Screens

SYNTRON Co., Homer City, Penn., has made available a new line of vibrating screens of variable speeds. The units are made up with stepped, punched plates having tapered elongated openings, the size of the latter depending upon material specifications. Single or multiple deck screen plates are furnished as desired.

The screen area is activated by a Syntron "Vibra-Flow" vibrating motor featuring variable control of material flow. This provides a two-purpose piece of equipment according to the company: a vibrating screen and a rheostat controlled vibratory feed-



Vibrating screen with stepped, punched plates having tapered elongated openings

er for increasing the efficiency and capacity of crushers and fine grinders and to prevent damage to belt conveyors by allowing the fines to cushion the lumps.

Indicator and Control for Smoke Density

GENERAL ELECTRIC Co., Schenectady, N. Y., has developed a new smoke density indicator and control designed to indicate industrial smoke density levels. The equipment also can be used to control over-the-fire heated air to the fire-box to reduce excessive smoke. The equipment consists of a light source, a phototube holder, and an enclosure containing the required control and incorporating an indicator calibrated in Ringlemann units, all in one packaged unit. A recorder, either of the continuous strip chart type or the circular "step" type, can be used in conjunction with

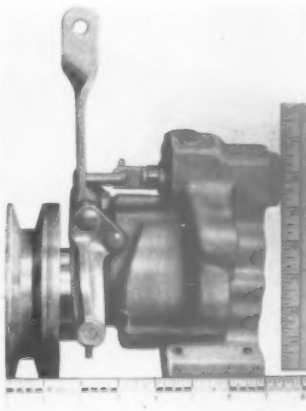


Smoke density indicator

this equipment. The first provides a continuous record of smoke density, and the latter provides a record of the number of times the predetermined smoke density level is reached.

Clutch-Type Pump

WAUKESHA HYDRAULIC CORP., Waukesha, Wis., has designed the Hydra-Clutch pump, a lightweight, hydraulic clutch-type power pump, for applications where hydraulic power is desired for periodic short lengths of time. When the power is required, the clutch is engaged, transmitting the power to the application. One control engages and disengages the clutch and operates the slide valve, and the unit operates only when power is needed. Dimensions of the unit are 7 in. long, 7 in. high and 4 in. wide. The unit contains an overload relief valve and is not hand pumped.



Hydraulic clutch-type power pump

Automatic Firing Controls

Alpha Portland Cement Co. installs long kiln and efficient dust collection at St. Louis plant. Firing highly instrumentalized; includes use of continuous oxygen analyzer

A MAJOR EXPANSION and rebuilding program was completed in 1948 at the Lemay (St. Louis), Mo., plant of Alpha Portland Cement Co., consisting of a long, wet-process kiln installation and greatly enlarged capacity for the collection of dust from the exhaust gases of the kilns. Capacity of the plant was increased some 25 percent when the new kiln went into operation.

By removing the short kilns from service and doubling the Cottrell electrical precipitator capacity by installation of a second unit of improved type, it is anticipated that 97 percent of the dust exhausted from the three kilns now in service will be collected.

Rated capacity of the kilns now in operation is 5000 bbl. of cement clinker per day which includes 2500 bbl. peak output from the new 10- x 380-ft. kiln, and 1250 bbl. from each of two 10-ft. x 8-ft. by 222-ft. 6-in. kilns. However, the capacity of the plant is limited to 4500 bbl. per day by the equipment in the raw grinding and finish grinding departments. The

By **BROR NORDBERG**

kilns are all direct-fired by coal or may be converted for gas-firing when natural gas is available for fuel. Slurry is ground to 90 percent passing 200 mesh and is fed into the kilns at 39 percent moisture.

New Kiln

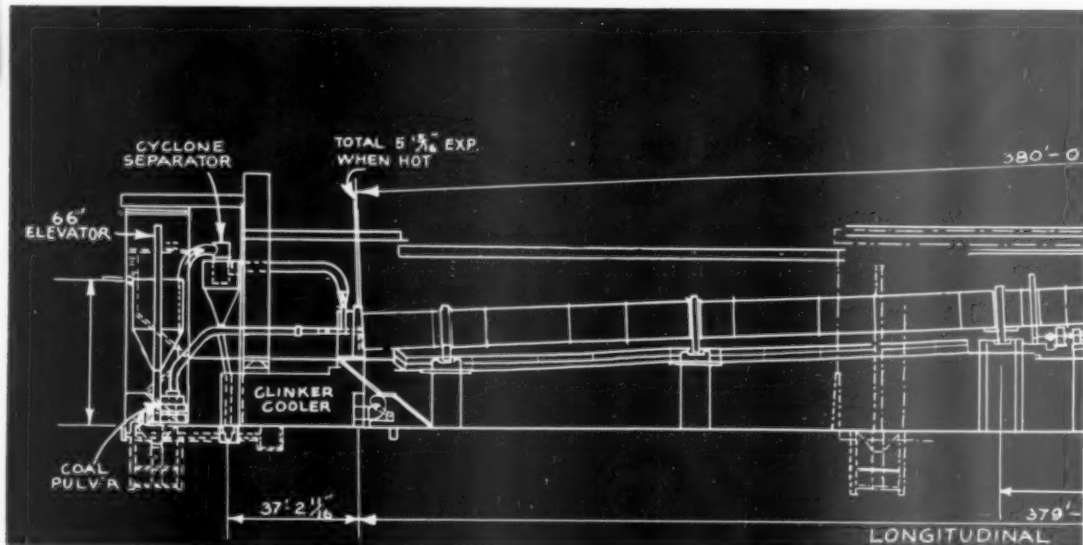
The new kiln has been installed, as shown herewith, alongside the old units. It is an all-welded F. L. Smith kiln, with Fuller inclined-grate, air-quenching clinker cooler and B & W type E-56 direct-firing coal mill. Its operation, which is discussed later, is highly instrumentalized and has a number of interesting automatic features.

The kiln has a slope of $\frac{1}{2}$ in. to the lineal foot and is lined with fire brick for its entire length exclusive of the chain section which has been reduced from 80 ft. originally to 70 ft. in

length. The chain section, consisting of 13-ft. lengths of $\frac{5}{8}$ -in. chain, starts 11 ft. from the cold end of the kiln, so the drying section terminates 81 ft. from the kiln end. Lining consists of 6-in., 70 percent alumina brick for 70 ft. in the hot zone, followed by 40 percent alumina brick extending back to the chain section, and the brick in the nose ring are of high temperature type. All trunnions ride in a bath of oil and water and the thrust rollers at the kiln drive will trip the motor drive automatically should a safe thrust pressure be exceeded.

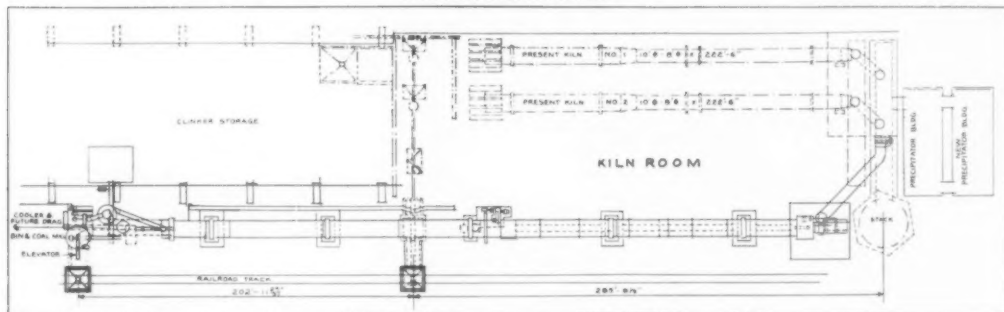
Kiln Drive

The kiln is driven by a 150-hp. direct-current motor from a motor-generator set through two flexible couplings and has a speed range of 35 to 95 r.p.h. Speed is held as nearly constant as possible at 55 r.p.h. Slurry is fed into the kiln by conventional ferris wheel feeder and its drive is tied electrically to the kiln motor-generator for automatic synchronized speed. Blinking lights on the operator's control panel



Elevation of new 380-ft. rotary kiln, equipped with air-quenching

INSTRUMENTATION



Plan view of kilns showing arrangement for exhausts to dust collectors

are an indicator that the slurry in the ferris wheel feeder is up to the overflow level.

Fuel

Actually, the kiln was designed to produce 2200 bbl. of clinker per day with a fuel consumption not to exceed 1,100,000 B.t.u. per bbl. and it is anticipated that that figure will be reduced by 100,000 B.t.u. It is equipped with standardized FLS kiln control centralized on the firing floor and a 100-hp. motor drives the induced draft fan.

Illinois bituminous coals, relatively low in calorific value and high in ash content, are burned. The coal, as delivered to the plant by truck or rail, averages slightly over 10,000 B.t.u. per lb., often contains as much as 18 percent ash and up to 12 percent moisture and has a top size of 1 in. Ordinarily it is dumped directly into a hopper from which a Jeffrey vibrat-

ing feeder regulates flowout to a bucket elevator filling a 60-ton bin over the coal pulverizer. The bin has high and low Bindicators to indicate when feed into the bin should be started or stopped. Coal bins of smaller capacity for the other kilns are similarly filled.

Firing Equipment

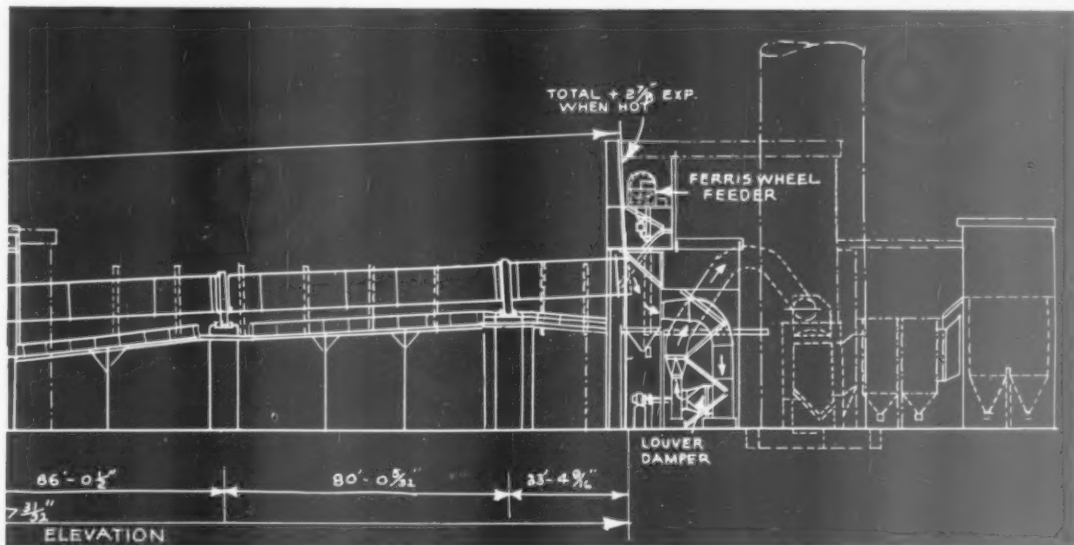
The size E-56 B & W direct-firing coal mill is located, as shown in the accompanying general layout, at a level below the operating floor and directly under the coal bin. It has a maximum grinding capacity of 18,000 lb. of coal per hr. ground to a fineness of 95 percent minus 100 mesh. Actually, average consumption is 11,000 lb. per hr., which allows plenty of reserve for unusual moisture conditions. The pulverizer is driven by a 100-hp., 600 r.p.m. motor and the 48-in. primary air fan drawing heated air from the kiln hood to dry the coal

is driven at 1800 r.p.m. direct from a 100-hp. motor.

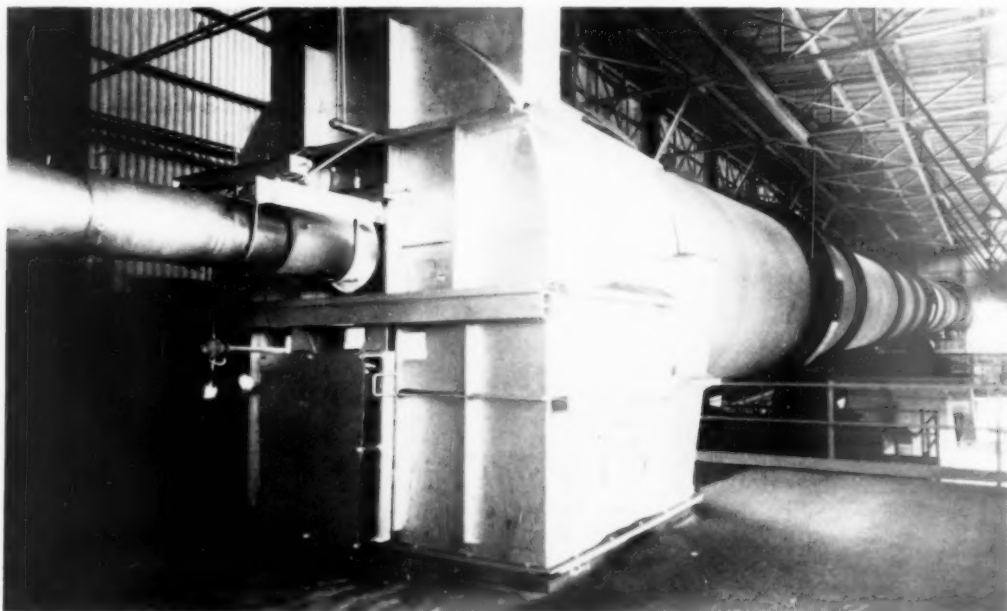
Auxiliary equipment consists of a 10-ft. diameter cyclone to trap clinker dust from the hot air stream, which discharges below to the clinker conveyor from the clinker cooler; an automatic air-tempering damper in the hot air pipe from the kiln hood to the cyclone; and the standard B & W pulverizer feed controller. The burner pipe is 13 3/4-in. inside diameter of 3/16-in. stainless steel, temperature-resisting alloy, within a 19-in. diameter bustle pipe. Performance with this simple method of air cooling has been excellent from the standpoint of burn-outs. Fuel is injected through the pipe at 6400 f.p.m. Primary air is being held at 25 percent by volume.

Clinker Cooler

Clinker discharges from the kiln over a No. 633 Fuller inclined grate, air-quenching clinker cooler from



clinker cooler, direct-firing coal pulverizer and dust precipitator



Firing hood for 380-ft. rotary kiln. Cool-burner pipe is air-cooled. Fuel is interchangeable from coal to natural gas. Clinker cooler and pulverizer are on floor below

which it is conveyed by steel drag-chain to a pit and then placed in storage by an overhead crane. By actual measurement, minus $\frac{1}{2}$ -in. clinker is cooled to room air temperature, 1- to 2-in. clinker to 100 deg. F. and the temperature of pieces from 1- to 3-in. size is in the range of 250 deg. F. The cooler has 1-ft. sectional grates 6 ft. wide for ease in replacement, which are of a new wedge-type design to hold the particles better in the air stream forced up from below. It is driven by a 10-hp. Reeves vari-speed drive and the fan is driven by a 50-hp. motor.

Heated Air

It is estimated that 80 percent of the air for combustion in the kiln is secondary air preheated in the cooler and that the balance (20 percent) enters the kiln hood through leakage. This heated air represents approximately one-half of the volume of air forced through the clinker bed in the cooler. The balance exhausts through the cooler stack. Temperature of the secondary air entering the kiln, as measured by thermocouple in the air stream just over the clinker bed in the primary section of the cooler, is held at 1100 deg. F. The cooler drive automatically speeds up or slows down if the temperature of the secondary air exceeds or falls below 1100 deg. F., respectively. The setting of a damper in the primary air duct can be varied to change the amount of air entering the kiln.

Dust Collection

The new Western Precipitation Cottrell dust collector is attached to the older unit through which the gases from the two older kilns exhausted, so that the two collectors operate in parallel. Gases from the three kilns enter a common flue and, through dampers, are divided to the two collectors and the cleaned gases exhaust to a common 300-ft. concrete stack. The precipitators are on the pressure

side of the induced draft fans. Exit temperature from the new kiln is held at approximately 500 deg. F.

The new collector is the type KL Cottrell with two units of three sections each. Two of the three sections consist of 15 duct, 8-in. centers, 8- x 18-ft. rod curtain discharge electrode assemblies and the third is a 12 duct, 10-in. centers, 8- x 18-ft. pocket electrode assembly. An estimated three percent of the total material put through the kilns, or 35 tons per day,



Side view of new mill building. Note that kiln is not housed for its entire length

of dust is expected to be recovered from the exit gases. This dust is mixed into a slurry in a small ball mill and pumped into the basin of the ferris wheel which feeds the kiln.

Kiln Operation

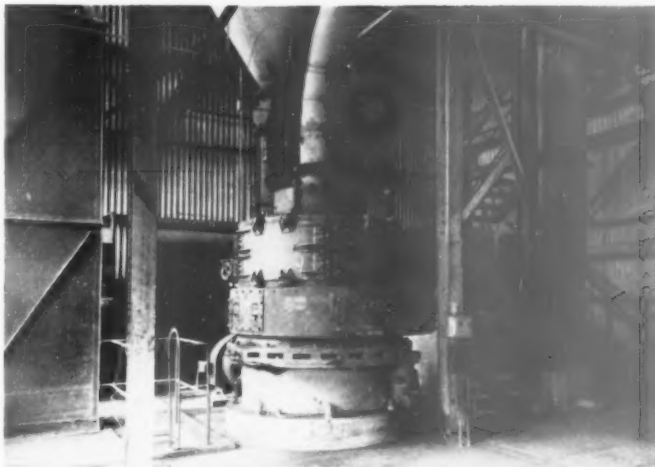
As stated earlier, the new long kiln is highly instrumentalized and has a number of automatic control features. One of the most interesting instruments is a recently-installed continuous oxygen analyzer and recorder which is to be the means of automatic and continuous re-adjustment of the fuel-air ratio to maintain the volume of oxygen in the exhaust gas stream at a fixed optimum figure of 1.5 percent.

Automatic controls now in operation include primary air damper control, the clinker cooler grate speed to hold a constant secondary air temperature, coal feed regulation, draft at the hood and feed ends of the kiln and kiln feed in accordance with kiln speed of rotation.

The B & W direct-firing system through its pulverizer feeder controller automatically maintains regulation of desired quantity of fuel feed in accordance with any quantity of primary air, and changes in fuel demand are taken care of automatically by changing the quantity of primary air put through the mill. Primary air differential is measured by a pitot tube in the duct of the clean hot air system. A thermocouple in the fuel-primary air discharge pipe from the pulverizer is the means of maintaining a desired temperature of 150 deg. F. and valves for regulating air flow and for controlling the air temperature are provided at the operating floor control station. A damper valve is set to hold a temperature of about 400 deg. F. in the suction side of the hot air line to the coal pulverizer. An accurately adjustable valve is the means for regulation of the amount of tempered air entering the mill.

The principal recording gauge on the operator's floor is a Bailey Multi-pointer gauge that records kiln draft

(Continued on page 128)



Direct-firing coal pulverizer for 10- x 380-ft. rotary kiln. Primary air-coal pipe is in front of overhead coal feed bin. Fan is to extreme right



Partial view of new kiln looking toward firing end



Inclined grate clinker cooler, showing primary end, left, with fan to force air through clinker bed. Drive (right picture) is of variable speed, automatically varied in order to hold temperature of secondary air into kiln constant



Stacker belt that builds up intermediate surge pile between pit and plant

LOCATED in the northern section of Metropolitan Los Angeles, the Roscoe plant of Consolidated Rock Products Co. is the company's second largest producing plant. The Irwindale plant is the largest. The operation, like most others of its kind in southern California, uses pit conveyors to bring material to the plant. There are five long 42-in. field belts with a surge pile interposed in the system.

Portable Primary Crusher

The primary crusher is portable and located near the loading skovel. As some of the gravel is quite large, a 36- x 42-in. Buchanan jaw crusher is mounted on widely spaced steel car-wheels that ride heavy rails so that the assembly can be moved ahead as necessary. Recently a "pendulum" conveyor was added at the loading end. This segment of the transportation system uses a 60-in. belt and the pendulum is 130 ft. long. At the high end next to the primary crushing unit, the assembly is pivoted so that the conveyor can be swung around in an arc of about 225 deg. A 120-B Bucyrus-Erie shovel that does the loading "toes" the outboard end around as needed. At the loading end there is a steel hopper provided with a wide-spaced grizzly at the top and a reciprocating feeder at the bottom. Any oversize too large for the Buchanan is side-tracked near the point of loading; but the number of such boulders is small. By means of this pendulum a swath 400 ft. wide can be cut, with 260 ft. of this being the diameter of the subscribed semicircle and the remainder being reached by the dipper stick of the shovel. The pendulum conveyor was supplied by Conveyor Co., Los Angeles.

Plant Changes

In the plant, changes are under way that will eliminate use of the older rotary "bull" screen or scalper. In its place the company is installing two 5- x 12-ft. double-deck Tyrock

Use Pendulum Conveyor In Sand, Gravel Pit

Plan to install new primary screening station at Consolidated Rock Products Co., Roscoe, California, plant



Geared-in-head motor driving 36-in. belt which recovers minus 3-in. material from rotary screen

vibrating screens, which are being mounted on a heavy steel superstructure directly over the old rotary. The latter screen is to be operated until the cut-over is made. The work is being carried out so that amount of time lost when the change is made will be minimized. The two screens are mounted in parallel and will operate dry. They will increase capac-

ity of the Roscoe plant 100 t.p.h., from 650 to 750 t.p.h. On the two important belts which take the minus 3-in. material from the bull screens to the top of the screening plant, U. S. Syncrogear motors have been installed: a 25- and a 30-hp. motor respectively. The 30-in. belts are carrying a heavy load. These geared-in-head motors are set out in the open and make a neat and serviceable installation. Much of the finished material is trucked from the plant which, together with the ready-mixed concrete plant that the company operates, is a very active and busy place. Maurice De Mears is superintendent, and George Alexander is pit foreman. C. H. Gale is plant foreman.

Inspect Gravel Plant

THE NORTH CENTRAL CHAPTER of the Ohio Society of Professional Engineers recently inspected the Killbuck Sand and Gravel Co., Danville, Ohio.



Pendulum conveyor, 60-in. belt on 130 ft. centers, connects to rail-mounted 36- x 42-in. jaw crusher. This system enables operator to cut 400-ft. swath before assembly must be moved. Primary crusher discharge is collected on first of five 42-in. belts connecting pit to plant

Aggregates For Davis Dam

Large project on Colorado river uses a shale pozzolan in mix to improve durability of concrete

By WALTER B. LENHART

DAVIS DAM is being built on the lower Colorado river about 67 miles below Hoover dam (Boulder dam), by the Utah Construction Co. under the direction of the United States Bureau of Reclamation. About an equal distance below Davis dam is Parker dam. Both Hoover and Parker dams are concrete and were built about 12 years ago. They are located in a very hot and dry climate, summer temperatures often reaching 115 to 120 deg. F. In the day time the air is usually well above freezing and most days is quite warm. At night it gets colder with short, nightly periods of freezing.

Much has been written about Hoover dam. The concrete work there is pointed out by many as an outstandingly successful piece of work. More has been written about Parker dam but in this case the critic's remarks scale down the other way. It was through studies of the concrete in Parker dam that the present terms "reactive aggregates," "corrective aggregates," "pessimum reactive agents," etc, first came into the literature relating to concrete aggregates.

One of two storage bins may be seen in foreground. One bin is for cement and the other for a pozzolan admixture. Batching plant, rear, with aggregate conveyor above

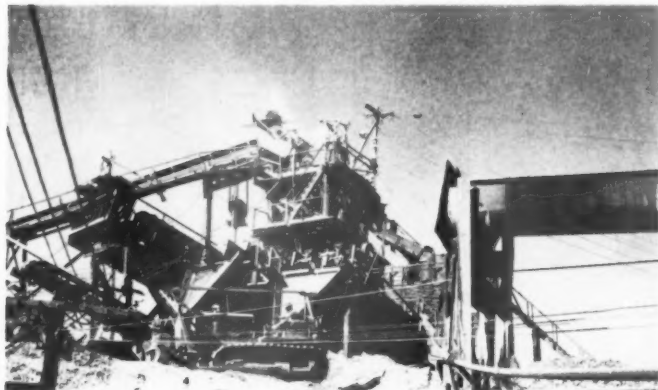
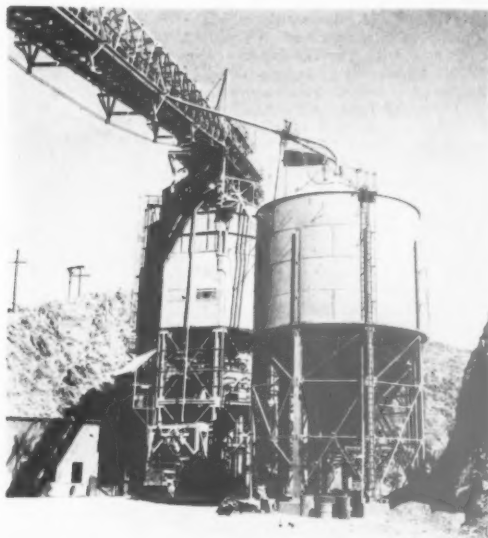
The aggregates used for Hoover dam were secured from alluvial deposits upstream, on the Arizona side of the Colorado river. At the time a quite modern sand and gravel plant was built there to wash, size, and grade the various aggregates used. Several time this interesting job was inspected but at that time reactivity of aggregates was unheard of so we took little note of the mineralogical or chemical character of the aggregates; but knowing something of the character of the Colorado river, its high velocity, flood characteristics, and of the country through which the river threads, the wide diversification of rocks and general geological character, we were inclined to assume that aggregates used at Hoover dam are

essentially little different from those further down the stream. Actually, however, they differ somewhat in content of volcanic rock.

We went to Davis dam for the prime reason of learning something about the mineralogical character of the aggregates being used and the observations can be summed up by using the word of one of the engineers, "The gravel contains about everything." Examination of materials being processed by the Davis Construction Co., which is supplying the aggregates at Davis dam showed this to be true; siliceous rocks, quartz, granites; some dark rocks, some light tinted and some highly colored; fine grained and coarse. The gravel would be just what one would expect from a river that cut through a thousand miles or more of bed that is made up of a great number of different rocks and strata from many different geological periods. The aggregates used at Parker dam, further down the river, were igneous rocks, felsitic in character.

Pozzolan Additive

With excellent concrete above Davis, not so excellent below, we were also interested in what Reclamation Engineers at Davis were doing about it. At the outset we wish to point out that the portland cement used at Davis dam is the so-called, low alkali cement and meets the 0.6 percent specifications for total alkalis. Along with this type of cement there is being used, for the first time on any major piece of dam construction, a new type additive which has been named "Pozzolan." This is a clay or shale that is known on the Coast as "Puente" shale and is secured from deposits



Immediately above the tractor, in the center of the picture, may be seen two sand classifiers; and to the left is a sand dewatering screw

near a small town by that name near Riverside, Calif., in southern California. As a generalization it could be classed with the Monterey shales of California that are more plentiful and better known. The chemical or mineralogical ingredient of the Puente shale that makes it of interest to *Rock Products* readers is that it contains around 25 percent opal which is an amorphous compound. Opaline rocks, or opal, is the classic example used to illustrate what is meant by a hydrated silica rock.

As several concrete engineers have pointed out, such rocks as opal in the aggregates, when in relatively small amounts, are bad, but if the amount present is relatively larger, the results are good. We are not going into any discussion here of this paradox but will leave that to the concrete engineers, but we do wish to bring it into the light, so the reader will possibly better understand why they are using pozzolan at Davis Dam.

One way to look at the theory behind the use of pozzolan or similar opaline rocks is that when water is added to the mix forming the concrete a certain amount of the alkali present is dissolved and is immediately available to attack any materials in the mix that might be soluble in the alkali. Any reaction that does take place uses up a proportionate amount of this alkali, and so essentially in this case much of the harmful effects of alkali with reactive aggregate is brought about while the concrete is still green. The alkali here attacks the opaline materials.

The engineers at Davis possibly realizing they had an aggregate of a highly complex nature wished to protect the concrete from any reactive aggregates in the deposit. So to get the mix above the "pessimism" point, they added an opaline material and that material is pozzolan. It is finely ground and has a surface area paral-



This stacker belt for coarse aggregates moves on widely spaced rails, allowing one assembly to stockpile four sizes of aggregate

leling that of portland cement. It also has been calcined at controlled temperatures in the 1500 to 1700 deg. F. range as they have found that by calcining the activity of the material is increased and the water-carrying properties reduced somewhat. The temperature of calcination is said not to be high enough to alter the opal content. We might add here that the opals are not the gem varieties and are microscopic in size, and determining the opal content of the shale requires special training in microscopic and petrological work. To date the opal-bearing shales from which pozzolan is made are only found in the far West. They are being processed by the California Portland Cement Co., at Colton, Calif. The cost of the pozzolan is said to be about that of portland cement but it was pointed out that Davis dam was the only user to

date; therefore the production costs, when reflected by tonnages used are considered, are probably slightly higher to users than will be the case when larger tonnages are handled and the material more generally used in concrete structures.

Aggregates—Mixes

At Davis dam they are adding 20 lb. of pozzolan to 100 lb. of portland cement. The coarse aggregates sizes used are similar to many of the other dam construction jobs, namely four sizes, with top sizes of 6 in., 2½ in., 1¼ in., and ¾ in. About one barrel of cement per cu. yd. is being used and strengths in the 5000 to 6000 p.s.i. range are being obtained. More details follow regarding characteristics of the mix, gradation of aggregates, etc. The sands produced are a blend from two Dorr-type rake classifiers and an Akins spiral sand machine.

The following is a typical mix for concrete containing 6-in. maximum aggregates:

Cement content	309 lb./cu. yd.
Pozzolan content	62 lb./cu. yd.
Water content	217 lb./cu. yd.
Slump	2 in.
Water	
Cement + Pozzolan = 0.585	
Percent sand	25

Typical resulting strengths of the concrete are about as follows:

28-day compressive strength	4,410 p.s.i.
90-day compressive strength	5,680 p.s.i.

The typical grading used for the sand and coarse aggregate is as follows:

Coarse Aggregates	
No. 4 to 1½-in.	20%
1½-in. to 1¼-in.	26%
1¼-in. to 2½-in.	32%
2½-in. to 6-in.	22%
Sand (Retained)	
No. 4	4%
8	13%
16	11%
30	10%
50	32%
100	25%
Pan	6%
F.M.	2.52



Conveyor serving the concrete batching plant, background, emerges from the reclaiming tunnel under the stockpile area

DURABILITY

The general specifications for the sand used at Davis dam are as follows: (the tabulation shows the maximum percentages of deleterious substances in the sand as delivered to the mixer):

	Percent by weight
Material passing a No. 200 screen	3
Shale	1
Coal	1
Clay lumps	1
Total of other deleterious substances, alkali, mica, coated grains and soft flaky particles	2

The sum of the above percentages must not exceed 5 percent.

The sand, as batched, must conform to the following grading:

Sieve No.	Cumulative percentage, by weight retained on sieve
4 (3.16 in.)	0 to 5
8	10 to 20
16	20 to 40
30	35 to 65
50	70 to 85
100	92 to 98

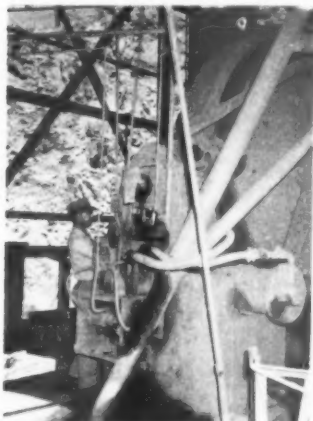
Fineness Modulus

The fineness modulus required is 2.40 to 2.90, and the grading is such that the fineness modulus of at least 9 tests out of the last 10 consecutive tests taken at the mixer will not vary more than 0.10 from the average fineness modulus of the 10 test samples.

On the coarse aggregate, the specifications require a quality that must conform with the tabulation that follows:

Designation of size	Nominal size range
$\frac{1}{2}$ -in. aggregate	$\frac{3}{16}$ to $\frac{1}{2}$ in.
$\frac{3}{4}$ -in. aggregate	$\frac{1}{2}$ to $1\frac{1}{4}$ in.
$1\frac{1}{2}$ -in. aggregate	$1\frac{1}{4}$ to $2\frac{1}{2}$ in.
2-in. aggregate	$2\frac{1}{2}$ to 3 in.

Separation of the four sizes is such that, when any size of aggregate, as batched, is tested by screening on the screens designated in the following tabulation, the average percentage of material passing the undersize test screen (significant undersize), for any 4 hr. period must not exceed 2 percent, for any size of coarse aggregate, and all material of any nominal size must pass the appropriate oversize screen.



A Bureau of Reclamation engineer standing beside one of two 4-cu. yd. concrete mixers used at this operation

Size	Size of square opening in screen For undersize test	For oversize test
$\frac{1}{2}$ -in. aggregate	No. 5 mesh	$\frac{7}{12}$ in.
$\frac{3}{4}$ -in. aggregate	$\frac{5}{12}$ in.	$1\frac{1}{2}$ in.
$1\frac{1}{2}$ -in. aggregate	1 in.	3 in.
2-in. aggregate	2 in.	7 in.

Processing

The gravel plant is quite simple. A Lorain shovel in the pit loads to trucks, two Tel-smith vibrating screens prepare the four sizes of gravel and the plus 6-in. material is discarded. The amount of this large gravel present is very small. The throughs from the lower deck flow to the Akins and to the Dorr classifier and two small sand piles are built up over a reclaiming belt. An RD-8 Caterpillar and dozer assist to push the sand over the reclaimer. The sand is quite wet when it goes up the final stacker belt to a large storage pile. From this pile the drained sand is reclaimed to a belt for truck deliveries to the batching plant near the dam up stream.

The gravel from the wet vibrating screens is collected in four, small, laminated wood bins that straddle a traveling conveyor stacker. When a bin is about full the operator moves his stacker to the desired point and empties the bin, then moves to the next bin and to the proper storage pile. It is quite a simple rig and enables the stockpiling of four gravel sizes with one piece of equipment and the piling of these sizes over short, individual reclaiming belts. No stone ladders are needed as the vertical drop of the aggregate is only a short distance. From the plant the aggregates are trucked to the storage pile near the batching plant, a haul of about $1\frac{1}{2}$ miles over oiled roads. Aggregates are being produced at the rate of 1200 cu. yd. in 8 hr. A study of the illustration of the stacker will show its main construction features.

The batching equipment used at Davis dam was moved there from the Fontana dam, one of the dams constructed by the Tennessee Valley Authority. ROCK PRODUCTS published a complete description of this operation in the Sept., 1943, issue. At that time the batcher had five 4-cu. yd. Smith mixers but at Davis dam only two of the mixers are installed. The plant still retains all the automatic features and was supplied originally by the C. S. Johnson Co. and still uses the recording features that were described in the previous article. The plant is giving excellent results and working out very satisfactorily for the operators. The batching plant is turning out an average of 135 cu. yd. per hr. with an occasional peak in the 160 cu. yd. per hr. range.

The rail head for Davis dam is at Kingman, Ariz. Portland cement from the Monolith and Riverside Cement Companies and the pozzolan from the California Portland Cement Co. are delivered to the point on the Santa Fe Railroad. At the outskirts of Kingman, the Utah Construction Co. has a



The two stub conveyors, foreground, are reclaiming belts from the aggregate storage area. They are designed for loading trucks

storage yard which includes two 5000 bbl. steel storage silos, one for portland cement and the other for pozzolan. The cars are unloaded at Kingman by a 5-in. portable Fuller-Kinyon pump. Trucks deliver both materials to the damsite over a paved road a distance of about 35 miles. The trucks haul $14\frac{1}{2}$ tons of portland cement and 10 tons of pozzolan, the latter being a bulkier material. At the batching plant on the Arizona side the trucks unload to a hopper that is served by another Fuller-Kinyon pump and the fine materials are pumped to two 5000-bbl. silos that are identical with those at Kingman. Two stationary F-K pumps mounted under the tanks deliver the materials to storage bins over the batching plant. In all there are five F-K pumps, one of which is a spare.

Over the batching plant are two sand bins, two cement bins, and four aggregate bins that are of steel, and octagonal in shape. They hold roughly 1000 tons. A 1700-ft. inclined belt delivers the aggregates to the top of the plant from a reclaiming tunnel. The coarser sizes are rescreened on top of the bins and any oversize is rejected via a chute to a truck hopper at ground levels.

The aggregates are delivered by trucks to a storage pile that is covered with a roughly constructed shed roof, the basic idea being to try and protect the materials from the intense heat of the desert sun.

The reclaiming tunnel under this storage pile is 275 ft. long and is 9 x 9 ft. in cross section. There are 11 chutes to feed the belt. Control of the flow of material to the belt is by raising or lowering the lip of the chute.

Along the batching plant is an ice plant containing three Vogt automatic tubular ice machines that can turn

Open Pit Phosphate Mine

Mine-run ore is trucked to portable primary plant at railhead for shipment to superphosphate plant at Pocatello, Idaho



Mine-run ore being dumped to a stockpile. This low-grade ore will be held for future processing

SIMPLIOT FERTILIZER Co. is well known in Idaho and contiguous states and the story behind the rise of J. R. Simplot, president, is especially interesting, showing that there are many opportunities for one with the vision and ability to carry out ideas that are basically sound. Only a few short years ago, Mr. Simplot was in the produce business, buying and selling Idaho potatoes. He soon found that many of his potatoes were being shipped to dehydrating plants nearer the coast, and decided that there was no reason why he should not dehydrate them first. From that idea came a modest dehydrating plant at Caldwell, Idaho. The plant was built at the right place and at the right time, just before World War II, when demand for dehydrated products for the armed forces zoomed to new highs. Mr. Simplot's plant grew with the demand until it became the largest dehydrating plant in the world, supplying the armed forces with 20 percent of the total dehydrated foodstuffs used.

In contacting the western growers for farm produce, Mr. Simplot found that it was necessary to supply them with large amounts of super-phosphates of which there was an acute shortage even though this section of the West was recognized as having

three-fourths of the nation's phosphate ores. His next step was to establish, in 1944, the Simplot Fertilizer Co., a super-phosphate plant, at Pocatello, Idaho, that, since its start, has gradually grown until it has a capacity of 200,000 tons per year of superphosphate. In addition, in 1946 an open pit phosphate mine was started 30 miles northeast of Pocatello.

The bottle neck in the expansion of the operation has been the shortage of sulphuric acid, which is being purchased at the present time from the Garfield (Utah) smelter of the American Smelting and Refining Co. During the war sulphuric acid was practically unobtainable, but the operators struggled through by using by-product acid from the powder factories and oil refineries.

The company has 2500 acres of phosphate-bearing ground located east of Fort Hall. This area is now in the process of being diamond drilled to determine the extent and depth of the deposit. A 22-mile standard gage rail spur has recently been constructed from Fort Hall to the mine, connecting the mine to the Union Pacific Railroad at Fort Hall.

The terrain is rolling hills. The ore, at present is being extracted from four adjoining pits, designated "A", "B", "C", and "E". On top of the ore there is from 0 to 200 ft. of a shale overburden that is, for the most part, a lower grade phosphate material

running from 2 to 30 percent P_2O_5 . The strippings are being stockpiled for the time being by a fleet of seven, 12-cu. yd. Euclid trucks. For loading ore and strippings, five shovels are available: one Bay City, three North-west and a Bucyrus-Erie shovel. Also assisting with the stripping are four D-8 caterpillar tractors which power 14- and 18-cu. yd. Le Tourneau scrapers. The largest shovel is $2\frac{1}{2}$ cu. yd. and the others are $1\frac{1}{2}$ to $\frac{3}{4}$ cu. yd. No blasting is necessary.

During 1947, shipment of 537,000 tons of phosphate rock was made on one contract to the U. S. army. This rock went to Japan and Korea.

The strippings are being piled in worked out portions of the pit in such a fashion that they later can be reclaimed. The company is starting an extensive research program to find a suitable process for beneficiating the phosphate bearing overburden. Flotation and slime washing, using Akintype washers, probably will play an important part in the processing.

The ore is a dark colored, friable rock that can be broken apart very easily. The Simplot Fertilizer Co. deposit has a thickness of 6 ft. The beds have a dip of 5-15 degrees from the horizontal to the southeast. Some faulting is present.

The ore is classed as a calcium fluorophosphate named Collophanite and contains up to 35 percent P_2O_5 with about 3 percent fluorine. Some vana-



Power shovel loading ore at the Simplot Fertilizer Co. mine to one of a fleet of 80 trucks that carries a total of 1800 t.p.d. to the reduction plant at the railhead



Truck, upper left, dumps mine-run rock to the portable reduction plant which in turn loads sized material to gondola-type railroad cars by means of the conveyor extending to the right

dium is also present. Complete analysis of this ore compared to other western phosphate rocks is given in Table I.

storage pile has a capacity of 65,000 tons and is located in a building 880 ft. long. When reaction is completed a power shovel delivers the material

	Fort Hall	Conda	Montpelier
Ignition loss	7.5	9.0	9.0
SiO ₂ (silica)	5.6	5.8	7.5
Fe ₂ O ₃ (iron oxide)	0.9	0.5	0.6
Al ₂ O ₃ (alumina)	1.5	1.4	1.1
CaO (calcium oxide)	45.0	46.5	46.0
MgO (magnesia)	1.2	0.6	—
Na ₂ O (sodium oxide)	0.5	0.9	—
K ₂ O (potash)	0.3	0.3	—
P ₂ O ₅ (phosphoric acid)	32.1	31.5	31.0
V ₂ O ₅ (vanadium pentoxide)	0.2	0.3	—
SO ₃ (sulphuric anhydride)	1.2	2.5	—
CO ₂ (carbon dioxide)	2.5	4.0	3.0
Fluorine	3.6	3.7	3.5
Organic matter	3.0	4.5	5.5

Table I: Analyses of Fort Hall rock, San Francisco Chemical Co., Montpelier rock, and Anaconda Copper Mining Co., Conda rock

The acidulation plant is north of Pocatello on Highway 30 where the gondolas can be unloaded to a stockpile or to a track hopper. The hopper is served by a belt conveyor which delivers the crude material to a 24- by 36-in. Jeffrey hammer mill that operates in closed circuit with a vibrating screen. Fine grinding is done in a battery of four Raymond mills. The larger of these mills have a capacity of 16 t.p.h. They operate with heated air from a coal-fired furnace so that the rock dries while grinding. Cyclone dust collectors are used.

The material is ground to 92 to 95 percent minus 100 mesh. Fuller Kinyon pumps deliver the ground rock to a weighing hopper serving a Steadman pan mixer where the acid joins the ground rock. For handling the acid, a Wilfley and a Dureo pump are used.

After addition of the acid, the material is carried by conveyor to a large storage pile where it is stockpiled until the reaction is completed. The

to a conveyor system that in turn delivers to a screen, with the oversize going to a hammermill. The fines enter the feed bin ahead of a St. Regis valve packer. Considerable shipments are made in bulk.

The head offices of the company are located in the Continental Bank Building, Boise, Idaho. Officers and staff are: J. R. Simplot, president; O. A. Power, vice president and general manager; G. A. McHugh, mine manager, and Wm. Tinto, plant superintendent.

Car Supply Requirements of Sand Industry

NATIONAL INDUSTRIAL SAND ASSOCIATION in a letter to the Association of American Railroads presented results of its survey of railroad car supply requirements for the industrial sand industry for the second quarter of 1949, compared with the second quarter of 1948. According to V. P. Ahearn, executive secretary, the returns indicate an estimated decrease

in car supply requirements of approximately 5 percent as compared with requirements for the corresponding period last year. The demand for hopper bottom cars is continuing to increase; the decrease in requirements extends only to box cars and flat bottom open tops.

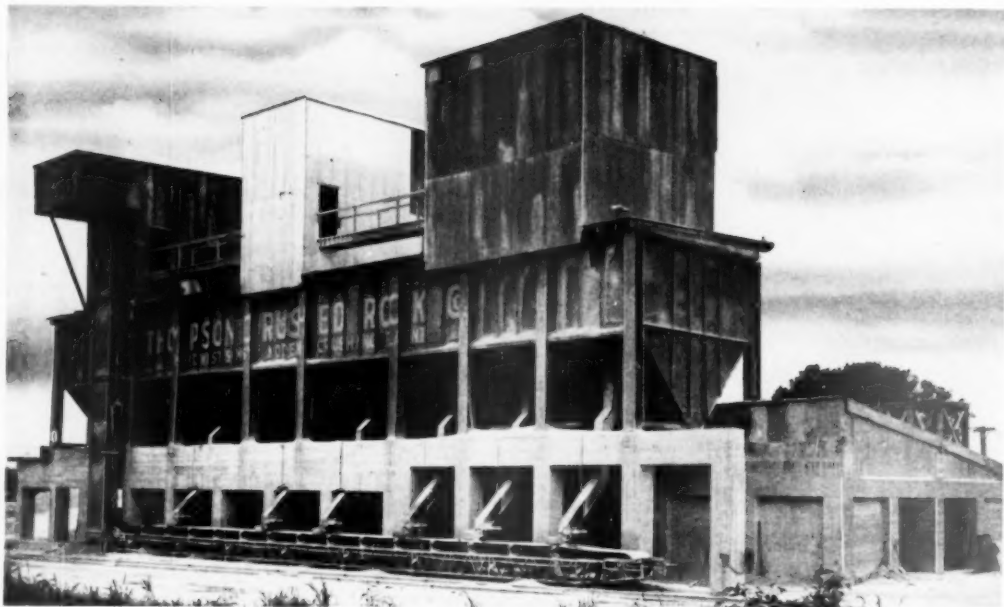
A. H. Gass of the Association of American Railroads replied that there may be some car supply difficulties in the future, particularly on box cars and gondolas. During the past year Class I railroads added 27,500 hoppers and nearly 3000 covered hoppers to ownership, the two types of equipment in which increased loadings were expected to develop. Difficulties in box car distribution in spring result when the large amount of grain in country storage is released on Government loans simultaneously with the harvesting of the new crop. Gondola supply has been tight throughout the winter, so with increased seasonal loading, some shortages may develop.

Cement in India

PLANS for installation of a cement plant at Bagalkot in the Bijapur district of Bombay Province, India, are being carried through with the assistance of Dr. A. G. Tendulkar, chief promoter of the company, who is expected to be the managing director. Although the plant would be operated by a public limited-liability company, the report is that the Government of Bombay would guarantee a minimum dividend of 3 percent on the entire share capital of the project for a period of 5 years and that three directors would be nominated by the Government, *Mineral Trade Notes* states. Dr. Tendulkar also will act as liaison official between the government and the board of directors of the company.

According to Dr. Tendulkar, the company will be known as Deccan Cement Co., and he is negotiating with three firms, including one in the United States, for the necessary machinery. Production is expected to begin in June, 1950. The plant, when installed, will have a capacity of 100,000 tons per annum and facilities to double the capacity within 5 years. The wet process will be used.

Although Bombay Province has been a great consumer of cement, this plant probably will be the first of its kind in the area. Dr. Tendulkar estimated that Bombay would require 300,000 to 350,000 tons of cement annually. The supply in recent years has not exceeded 200,000 tons. To fill the gap between supply and demand, the Government of India proposed the erection of three manufacturing plants in Bombay Province, each with a capacity of 100,000. The Bagalkot is the first of the three; the other two are expected to be established in Ahmedabad and in the suburbs of Bombay city. Plans for the last two plants have not yet materialized, however.



All-steel bins of heavy construction mounted on reinforced concrete foundations. Conveyor belt, foreground, transfers blended materials of any desired proportion to final bin via bucket elevator, extreme left

Simplicity of Plant Layout Key to High Production

**Riprap stone up to 150 lb. sized over vibrating screen
and handled mechanically. Plant designed for continuous production of all commercial stone products**

SIMPLICITY OF DESIGN is the outstanding feature of the new crushed limestone plant of Thompson Crushed Rock Co., Kansas City, Kan. The plant was built to produce 2000 tons of stone products in 8 hr. ranging in size from agricultural limestone to riprap stone, by an arrangement of equipment that requires a minimum of intra-plant handling. It might be described as a straight-line plant since only one closed circuit between crushers and sizing screens is required in producing some nine odd sizes of stone. Another feature of special interest is the mechanical sizing and handling of riprap as an adjunct to the main plant production.

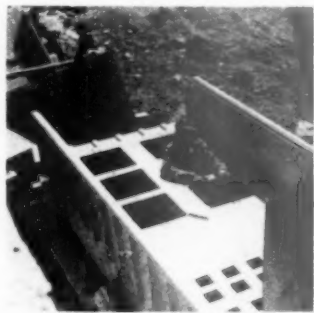
Located on the main line of the Santa Fe railroad at Morris, Kan., a few miles west of Kansas City, the plant was built to replace a smaller operation that had produced railroad ballast almost exclusively for some 40 years. Maximum production of the dis-

By BROR NORDBERG

continued plant was 1000 t.p.d. at the time it was replaced in 1948. Built by H. B. Thompson in 1911, the property was sold to the present owners in 1942, and recognition of the need for diversification and economical operation led to the decision to build the operation described herein. The old plant was shut down on March 4, 1948, and on May 12, 1948, just three months later, the new large capacity plant started production.

Providing for simplicity not only in operation but in maintenance, the plant was designed and built for permanence. Wherever possible duplicate equipment was specified and each principal production unit, including vibrating screens and crushers, has an over-capacity rating so that production can easily be maintained and sizing be accurate.

Principal equipment consists of a 30-in. Allis-Chalmers Superior-McCully gyratory crusher of 300 t.p.h. capacity at 6-in. setting, a 16-in. sec-



View to show size of riprap vibrating screen openings. Smaller openings, foreground, are 5 in. square on first part of screen



Dumping mine-run stone to riprap screen. Plus 14-in. stone is by-passed (chute lower center); while 14-in. stone is stockpiled as riprap by belt conveyor, end of which may be seen in illustration to right. Note size of stone about to fall from discharge point of belt. Minus 5-in. stone through this screen feeds on to main conveyor from primary crusher to scalping screen

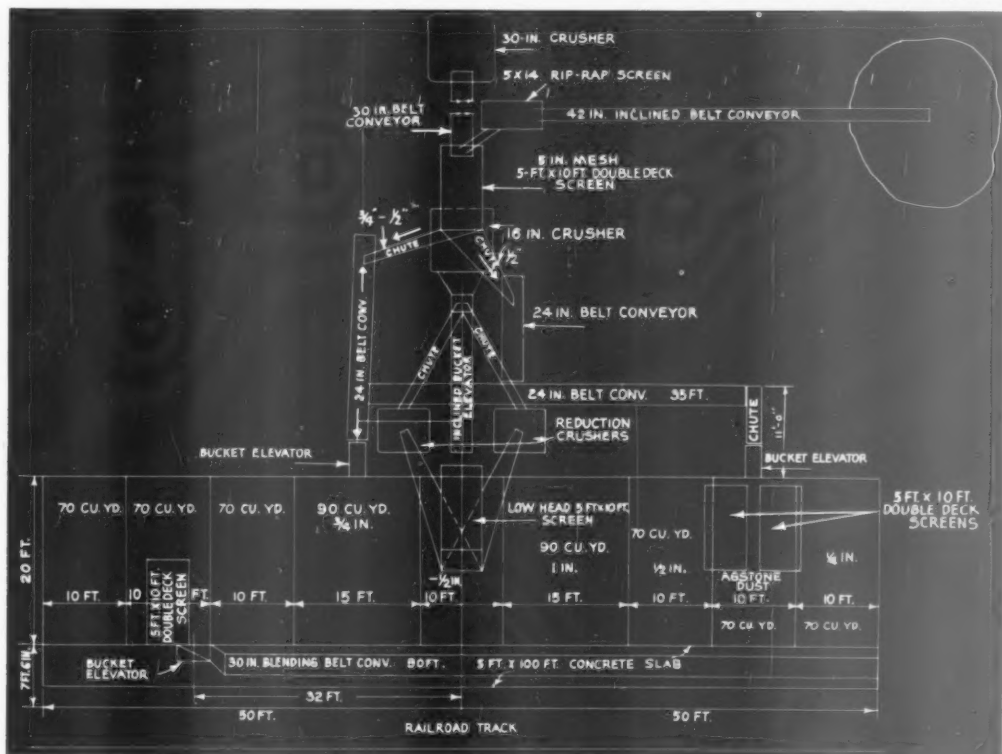
ondary of the same type, two No. 636 Allis-Chalmers type R reduction crushers and five 5- x 10-ft. double-deck Allis-Chalmers Ripl-flo vibrating screens. Belt conveyors and Link-Belt bucket elevators have also been standardized. The plant has bin capacity for 870 cu. yd. of product and a blending belt conveyor for recombination of any proportions of sized products from the bins, to add flexibility to the

operation. The layout, as shown herewith, is very compact.

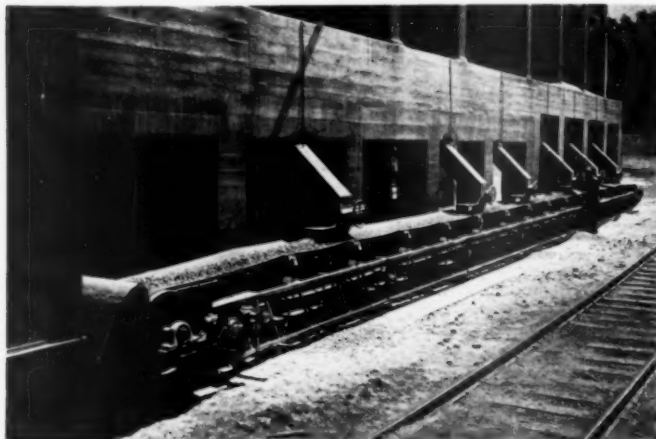
The Stone

This is a mining operation in the stratum of Bethany Falls limestone that prevails throughout the Kansas City area and some 40 acres of stone have been mined out, by conventional room-and-pillar methods, from a hill close to the plant. Entries through

the hill provide natural draft for ventilation. Four International KR11 end-dump trucks haul 9 to 10 tons of stone from the mine to dump into the primary crusher. Drilling is done by a truck-mounted Sullivan Hydro-Jib which is an hydraulically-operated pneumatic drill. Trucks dump into a hopper feeding the primary crusher and a 30-in. belt conveyor, 105-ft. centers, carries the minus 6-in. product



Layout of new crushing-screening plant. Note riprap operation



Blending belt that allows controlled recombination of separate sizes from individual bins, above

over a heavy-duty scalping screen where a split is made in three directions.

A $\frac{1}{2}$ - to $\frac{3}{4}$ -in. size retained on the bottom deck of the screen is one of the principal products. A chute transfers this stone on to a 24-in. inclined belt conveyor which discharges into the boot of a continuous bucket elevator filling one of the storage bins. Plus $\frac{3}{4}$ -in. stone is put through the secondary 16-in. gyratory crusher which is normally set for 2 $\frac{1}{2}$ -in. discharge opening. As shown on the accompanying layout of the plant, this product is elevated and screened, two finished sizes are produced and an oversize (usually plus 1 in.) is returned to the two type R reduction crushers. Product of the two crushers is then re-screened over the same vibrating screen.

All minus $\frac{1}{2}$ -in. stone as screened out by the scalper, and that produced by the reduction crushers, is carried over 24-in. belt conveyors and elevated to be put over two vibrating screens in parallel which are located over bins at one end of the row of bins. Here, a $\frac{1}{4}$ - $\frac{1}{2}$ -in. stone, a $\frac{1}{4}$ -in. product and agricultural limestone are screened out into their respective bins.

It will be noted that the normal range of commercial stone sizes produced is in $\frac{1}{4}$ -in. size increments in the range from 1 in. down to dust. In this area 1 in. happens to be the top size preferred for concrete aggregates and for other construction uses. However, the reduction crushers can be changed quickly by hydraulic adjustment should there be need for varying the product sizes or the percentages of the several respective products conventionally produced.

Bins are of unusually sturdy construction, arranged in a row of nine so that the various products may be blended over a common 3-in., 80-ft. centers, Pioneer blending conveyor at

ground level. Bin hopper bottoms are of $\frac{3}{8}$ -in. steel plate, the side walls are of $\frac{1}{4}$ -in. steel and support is by 14-in., 79-lb., H-beam columns.

Accurately adjustable bin gates are the means of regulating flowout from any combination of six bins on to the blending belt. This belt discharges into the boot of a bucket elevator and the stone is elevated and put over a vibrating screen, or by-passed, into any of the remaining three bins which serve as stockpiling bins for loading into cars. The screen is a washing screen and its use is optional. There is no general requirement for washed aggregates in the area but the plant is equipped for occasional washing now and will likely be expanded later

for washing more tonnage. A well has been drilled for a supply of wash water which is available at the rate of 400 g.p.m. at 90 p.s.i. pressure. Track facilities at the plant will accommodate 38 empty cars and 50 loaded ones.

Riprap

Producing stone up to 14-in. top size (riprap), the plant is one of very few commercial operations in the United States set up for the mechanical screening and handling of stone products that large, simultaneously with the production of commercial aggregates.

At present, the company has a contract for 125,000 tons of riprap and filter stone, with the Corps of Engineers, for the Kansas City Flood Control Project involving the Missouri and Kansas rivers. This stone is specified for the construction of flood walls, levees and appurtenances.

Specifications for riprap require that 100 percent of the pieces weigh less than 150 lb. each, that 80 to 100 percent be less than 100 lb., that 25 to 55 percent be smaller than 25 lb., and 0 to 5 percent may be less than 5 lb.

Filter stone gradation requirements are as follows:

Percent Passing	Square Openings
100	3 in.
65-100	2 in.
35-65	$\frac{1}{2}$ -in.
19-40	No. 4
0-10	No. 16

Filter stone is produced through the main plant and requires only that crusher settings and screen sizes be changed.

(Continued on page 130)



Hydraulically-operated pneumatic drill mounted on truck chassis for portability

Hydraulic Sand Classifier

Discussion of a hydraulic classifier using a high water column, baffle plates and separate, intercommunicating chambers for particle settling; plus examples of two installations

A RELATIVELY NEW development in hydraulic classifiers in the silica sand industry in the mid-continent area is represented in the use of the Morris Reflux classifier as the cleaning element. Two plants are now in successful operation using this device for washing silica sand for the glass and chemical market, where the almost complete removal of clays is imperative, and where the iron content must be held below 0.03 percent. From the results being obtained in actual commercial operation, it would appear that this equipment would find a field of use in other industries handling fragmented materials, and that it would bear out in actual practice the indications obtained experimentally on materials other than sand.

Classifier Features

After describing this device and pointing out the novel features in its design, the two operating plants will be discussed. The Morris Reflux Classifier (Fig. 1) is a counter-current, delayed settling device which embodies several ideas unique in this field. Most such devices consist of a low vessel containing essentially a single chamber, in which no attempt is made to prevent the dirty feed from slugging directly to the bottom to become mixed with the sand already partially or wholly washed. The overflow facilities of such chambers provide no means of controlling the turbulence of the rising fluid just ahead of the overflow, so that some usable particles are carried out with the overflow water and so are wasted. In the classifier under discussion a high column is used. This is divided, by an interior baffle system, into a series of separate intercommunicating chambers, separated from each other by inclined floors consisting of conical annular elements from between which issues a rising column of water. The raw slurry is introduced through a central stack at a point about $\frac{2}{3}$ of the distance up the column, and between this point and the bottom of the column there are eight such separate compartments through which the sand passes downward, progressively becoming cleaner and cleaner, and progressively encountering cleaner and cleaner water. The situation is closely analogous to giving the raw slurry eight separate washings and pouring

By ALEXANDER B. MORRIS

off the wash water between each one. In its passage down the column the sand is alternately directed from the walls of the vessel toward the center, and from the center toward the walls. This alternate concentration and

spreading out of the solids serves to furnish scouring friction and immediately thereafter to present a broad thin curtain of solids to water that is cleaner than that passed through previously.

Above the feed point is another set of similar baffles which collect and direct to the lower portion of the column, below the entering dirty stream, all those particles of usable size which have been carried above the feed point by the turbulence of the entering stream. A means is provided to shield this reflux stream from contact with the entering slurry and to deliver it directly into the top of the lower portion of the column. Above this top set of step baffles is a bank of straightening vanes, consisting of a honey-comb element with tubes 3 x 18 in. extending over the entire cross-sectional area of the vessel, the function of which is to quell all turbulence in the rising column of water before it reaches the over-flow level. The upper two feet of the column are entirely unobstructed, providing a settling chamber in which all particles of a size desired to be saved can settle back into the system, through a quietly rising column of water. This permits a close control on the size of the largest particle of given specific gravity which will pass over the overflow.

Size Grading

Where size grading is desired, two or more columns can be run in series (Fig. 2), the overflow from the first column, of small diameter and high water flow rate, becoming the feed for the second column, of greater diameter and lower flow rate. Thus coarse material collects in the first column, a finer grade in the second, and a still finer grade in the third, the overflow from the last column passing to waste ponds. Table I shows experimental results of a two-stage operation on a fine California glass sand. Note the sharp definition of separation between 35 and 48 mesh in the high stage column, and at 150 mesh in the low stage column.

The discharge of the clean sand is effected by manual control through a series of rods and swings identical to those formerly so widely used to actuate railroad signals and switches. The angle swings and bank of operating levers can be purchased from any

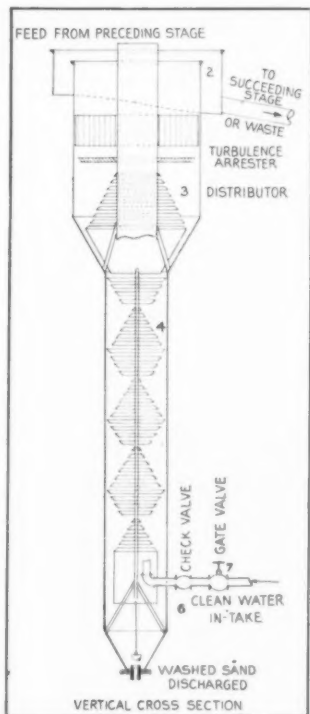


Fig. 1

Cross section of classifier; Feed stack high up in column. 2. Overflow trough. 3. Large diameter upper section. 4. Small diameter lower section. 5. Check valve on wash intake. 6. Gate valve on wash water intake. Note eight washing chambers arranged serially in lower section where washing takes place, baffles in upper section and by-pass to return material settled out above directly to mouth of lower section; also turbulence queller and open settling chamber above and immediately ahead of overflow

railroad supply house, but those used in the Oklahoma Silica Sand plant described herein were home-made after catalog drawings, and are entirely satisfactory. The discharge valve is

made entirely of rubber, and one has been in service at the Santa Anna plant for over a year with no sign of wear. Steel valves are cut away in a few minutes.

Silica Sand Separation in Two Mid-Continent Plants

THERE ARE two plants where the Morris Reflux classifier is in actual commercial use. In both of these plants it is being used as a washer only, no size grading being undertaken at either plant.

The plant of the Santa Anna Silica Sand Co. is situated at Santa Anna, in Coleman County, Texas. It began operations in the latter part of 1944. It derives its sand from a 25-ft. thick stratum in the Glen Rose formation of

Lower Cretaceous age, occurring close to the top of one of the many out-riders along the edge of the high plains. This is a loosely consolidated, light gray sand overlain by some 30 ft. of limestone and shale overburden, but as the bed itself is some 75 ft. above the level of the surrounding plain, it is possible to take full advantage of gravity flow throughout the entire operation. The sand is mined by a $\frac{3}{4}$ -cu. yd. Lorain shovel

after being stripped of overburden which is blasted and then bull-dozed into the mined out area. The sand is hauled to the grizzly in a 5-ton truck, the truck operator acting also as shovel operator. From the bin beneath the grizzly, the material is fed to a short belt which lifts it about 8 ft. to a 16-mesh revolving screen, the first three feet of which have been blinded out and provided with baffles which aid in reducing lumps and in securing the complete wetting of the sand mass. Oversize from this screen, consisting of hard lumps of sand and fragments of shale, is wasted. Undersize, together with all the screening water, flows to the intake stack of the classifier. The washer operator also takes care of the screen and feed belt. His station is in the end of the screen house, from which position he can see the material being discharged, and from where he can regulate the flow so as to prevent the venting of excess water with the washed sand. The initial plan was to dry-screen the raw sand and to feed it into the classifier with a minimum amount of water, but this was found impossible, and wet screening was substituted. This necessitated the use of so much more feed water that velocities in the upper section were increased beyond design limits. An auxiliary column was therefore added to catch the fines carried over as a result of this additional feed water; so that at this plant there actually exists a 2-stage operation, although both products are run into the same pit.

Drain Pit and Dryer

The two streams come together in a chute below the washers which discharge a thick slurry containing about 1:1 water to solids into the box of a sand drag. Just enough clean water is added in the chute to prevent its becoming clogged. The drag operates at low speed and drops the largely de-watered sand upon a swinging conveyor, the far end of which is supported on a cable extending over the drain pit. As the wet sand piles up under the end of this conveyor (about 15 ft. high), it becomes thoroughly de-watered in 24 hr. so that the pile washed one day is ready for drying the next. The drained sand is fed into the dryer by means of a slip scraper, the return sheave for which can be hooked into any one of a number of rings on the far side of the drain pit. These details are clearly shown in photographs No. 1 and 2.

The dryer is mounted on railroad car wheels as trunnions, which run on two locomotive tires welded to the shell of the dryer. Natural gas is used as fuel which makes it possible to dispense with a combustion chamber, the burners being placed inside the shell of the dryer. This placing of the burners makes an exceptionally strong current of air through the dryer necessary, so that a large amount

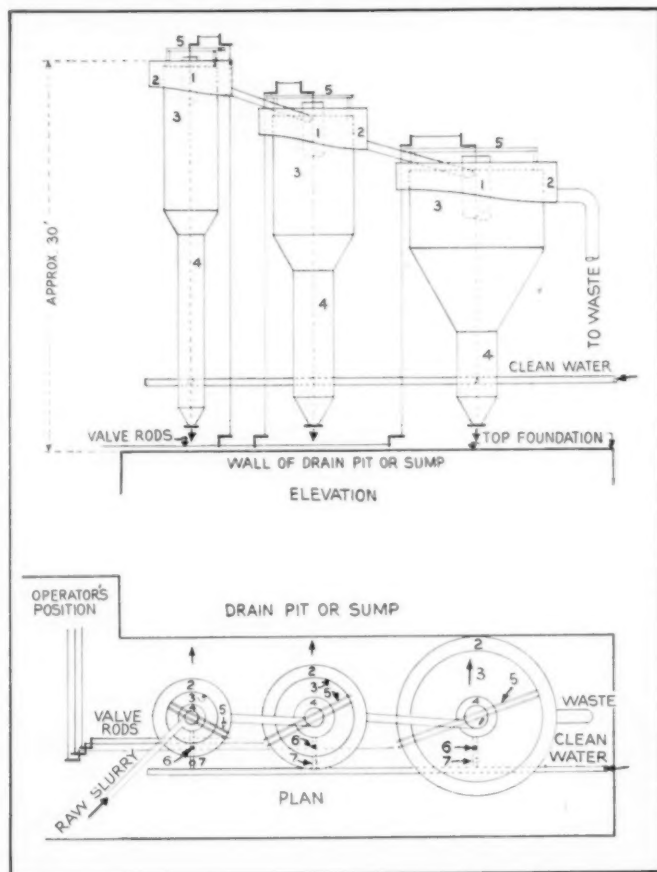


Fig. 2:

Elevation and plan of three-unit classifier installation: 1. Feed stacks. 2. Overflow troughs. 3. Large diameter upper section. 4. Small diameter lower section. 5. Overhead ridge for supporting valve linkage. 6. Check valves on wash water line. 7. Gate valves on wash water line



No. 1, left: Screen house at Santa Anna Silica Sand Co. plant, above, and classifier, sand dewaterer, stacker belt conveyor, below. Steel girders, center background, will support roof being erected over drain pit. No. 2: Right, drain pit, with girders same as in preceding picture. Note stacker conveyor, center, and path made in previously drained pile of sand leading to covered storage house, adjacent to gas-fired rotary dryer

of sand is drawn into the air stream. This would cut the fan to pieces in a short time but for the knock-out tank introduced in the suction line ahead of the fan. This consists of a 40,000-gal. horizontal cylindrical tank, equipped with two small hoppers on the lower side. In this tank the velocity is so reduced that all sand drops out of the air stream, collects in the hoppers and is returned to production on a small conveyor which runs beneath the tank. The air is also cooled in the tank so that all air reaching the fan is at a low temperature and free from sand (photograph No. 3).

Upon entering the dry-storage house from the dryer, the washed and dried sand passes over a 28-mesh vibrating screen on which are removed all over-sized particles that passed the wet screen, and a considerable volume of very small particles of shale and

pellets of sand which have not been broken up in the process. The cementing material of these pellets is high in iron, and their removal greatly increases the quality of the product, while occasioning but a very small loss in output.

The railroad spur is at a lower level than the dry storage house, and even covered hopper cars can be loaded by gravity. Photograph No. 4 shows one such car being loaded. The conveyor, the end of which appears in the cut, can also be used to load box cars. When being used in that manner it is lowered to flow level, run out until it projects into the middle of the car, and then feeds a belt-type car loader which distributes the sand toward the ends of the car.

Oklahoma Plant

The plant of the Oklahoma Silica Sand Co. is situated at Hickory, Murray County, Okla. This plant derives its raw material from a very thick bed of exceptionally fine white sand in the Oil Creek formation of Ordovician age. This bed is reported to be in excess of 100 ft. thick, and lies horizontally, about 10 ft. below surface level, under a thick red clay. Only the upper 40 ft. of this bed are now being mined, but it is evident that this plant has an enormous reserve of sand available for future operations.

The sand is mined hydraulically, and is washed into a sump from which it is lifted by a centrifugal pump to be fed into the feed stacks of the 4-unit, single-stage installation of the Morris Reflux classifier. The lift is approximately 50 ft. and some diffi-

culty has been experienced in securing a sufficient volume of sand delivered to the washers without an excessive amount of water. Steps have been taken to correct this situation, and a surge box has been installed above the washers to reduce the volume of feed water. Views shown in photographs Nos. 5, 6 and 7 were taken before the installation of this surge box.

Drain Pit and Dryer

The washers discharge the washed sand in a thick slurry into one end of a horse-shoe shaped drain pit (photograph No. 7). On the island within the horse-shoe is a crawler crane with a clamshell bucket attached to a 50-ft. boom. The plant is so laid out that from one location, the clamshell rig reclaims the freshly washed sand from in front of the washers, deposits it in a pile in another part of the pit; reclaims dewatered sand from the pile



No. 3: Blower house, foreground, with sand knock-out tank, right. Screen house, upper background



No. 4: Method of loading covered hopper cars on spur below covered storage house

CLASSIFICATION



No. 5, left: Top of three of four classifiers at the plant of Oklahoma Silica Sand Co. Linkage actuates discharge valves. No. 7, right: Underflow from classifiers shown in left-hand picture. This underflow is approximately 50 percent minus 100 mesh

thus deposited the previous day and feeds it into the hopper of the dryer.

This dryer is oil fired, and so has to have a combustion chamber ahead of the dryer proper. The dried sand is fed to an enclosed elevator on the outside of a concrete silo, 20 ft. in dia. and 50 ft. high, which provides the dry storage. As in the Santa Anna plant, a 28-mesh vibrating screen receives the sand from the dryer and removes all over-sized materials. In this case there is a considerable quantity of large pieces, as the only screening before that point has been the 1/4-in. trash screen at the pump intake. As this sand contains very few grains which will remain on a 60-mesh screen, the 28-mesh screen in the dry storage house results in practically no loss of marketable sand. Cars are loaded by gravity from a side outlet in the silo.

The overflow from the washers and from the surge box is run to the first of a series of four settling ponds hav-

ing a combined area in excess of two acres. The settled water is used in the mining operation, feed water for the washers coming directly from a well.

Experimental Work

Experimental work with this classifier on ores of the heavy minerals such

as mercury, copper, lead, zinc, etc., have not so far been encouraging, but with substance where the values reside in the particles of lower specific gravity, experimental results indicate that this unit may have a wide field of application. Table I illustrates the sharp definition of separation when operating on size-grading of a single

Set to retain +35-mesh in High Stage and +150-mesh in Low Stage							
Held on Screen	Original Sample Grains	High Stage		Low Stage		Fine Waste	
		Gr.	Percent Present	Gr.	Percent Present	Percent of Original	Percent of Original
8 mesh	37	37	100.0	—	—	—	—
16 mesh	30	30	100.0	—	—	—	—
20 mesh	80	80	100.0	—	—	—	—
28 mesh	827	568	68.9	259	100.0	—	—
35 mesh	2,062	292	14.2	1,770	100.0	—	—
48 mesh	595	20	2.2	875	100.0	—	—
60 mesh	4,319	5	0.1	4,314	100.0	—	—
80 mesh	1,652	5	0.3	1,647	100.0	—	—
100 mesh	2,267	—	—	2,207	97.4	2.6	—
150 mesh	3,917	—	—	1,740	44.4	55.6	—
Pan	16,086	1,037	6.4	12,812	85.0	13.9	—
Totals	16,086	1,037	6.4	12,812	85.0	13.9	—
Distribution	100.0 Percent	6.4 Percent		79.7 Percent		13.9 Percent	

Table 1: Separation of a California glass sand

Set to Retain +60-mesh in High Stage and +150-mesh in Low Stage							
Held on Screen	Original Sample Grains	High Stage		Low Stage		Fine Waste	
		Gr.	Percent Present	Gr.	Percent Present	Percent of Original	Percent of Original
8 mesh	816	816	100.0	—	—	—	—
16 mesh	547	547	100.0	—	—	—	—
20 mesh	248	248	100.0	—	—	—	—
28 mesh	910	905	99.5	5	100.0	—	—
35 mesh	2,097	2,052	97.9	45	100.0	—	—
48 mesh	4,506	4,106	91.2	400	100.0	—	—
60 mesh	2,103	1,551	73.9	552	100.0	—	—
80 mesh	5,032	1,858	38.9	3,974	100.0	—	—
100 mesh	831	35	4.2	796	100.0	—	—
150 mesh	762	10	1.3	752	100.0	—	—
Pan	7,504	5	—	975	13.0	86.9	—
Totals	25,356	12,233	48.2	6,599	50.2	25.7	—
Distribution	100.0 Percent	48.2 Percent		26.1 Percent		25.7 Percent	

Subsequent screening of Stage products yielded following results:

	Products		Wastes		Total
	+20	-20	Coarse	Fine	
High Stage	1,611	2,957	7,665	—	12,233
Low Stage	—	6,599	—	—	6,599
Overflow	—	—	—	6,524	6,524
Totals	1,611	9,556	7,665	6,524	25,356
P ₂ O ₅	69.1 Percent	43.0 Percent	3.6 Percent	3.7 Percent	22.63 Percent
P ₂ O ₃	90.97 Percent	—	9.03 Percent	—	100.0 Percent

Table 2: Concentration of a Florida phosphate clay



No. 6: Four unit, single-stage classifier installation at Oklahoma Silica Sand Co. plant

CLASSIFICATION

Weight in Grains						
Held on Screen	1	2	3	4	Total	
	High	Intermed.	Low	Overflow	Gr.	Percent
16 mesh	427	a 55			482	2.0
20 mesh	218	140			358	1.5
28 mesh	268	1,049			1,317	5.5
	913					
35 mesh	146	2,357	a 30		2,533	10.7
48 mesh	196	3,125	226		3,547	15.0
		6,726				
60 mesh	53	b 1,338	298	a 6	1,696	7.2
80 mesh	20	2,803	1,581	c 75	4,479	18.9
100 mesh	5	754	547	c 90	1,396	6.9
			2,682			
150 mesh	5	901	825	d 667	2,398	10.1
Fan	13	324	1,044	e 4,112	5,493	23.2
Totals	1,351	12,846	4,551	4,950	23,698	100.0
Percent	5.7 Percent	54.3 Percent	19.2 Percent	20.8 Percent	100.0 Percent	

Notes:

(a) Largely organic trash.
 (b) 35 percent ash here considered as waste. See below.
 (c) Both together show only 15 percent ash. Very small quantity.
 (d) 33 percent ash.
 (e) 80 percent ash.

Analysis of Recovery Efficiency					
Source	Weight	Percent Combustible	Combustible		
			Lost	Saved	Total
Col. 1	913				
Col. 2	6,726				
Col. 3	2,682				
Product	10,321	90 +		9,259	9,289
Col. 1	438				
Col. 2	6,120				
Col. 3	1,869				
Coarse Waste	8,427	15	1,246		1,264
Overflow	4,950	29	1,411		1,411
Totals	23,698	50.5	2,657	9,259	11,964
Over-all recovery efficiency			22.3 Percent	77.7 Percent	100.0 Percent

(b) If this fraction had been included in portion recovered, over-all recovery of combustible would have been raised to 85 percent, but ash content of product would have been somewhat increased.

Table 3: Recovery of granulated coal from Susquehanna river silt (three stage operation)

substance. Tables 2 and 3 illustrate the degree of concentration possible with this device in conjunction with suitably selected screens. Table 2 deals with a Florida phosphate clay. The phosphate is of considerably lower specific gravity than the sand and clay portions. The screen analyses of this and of the river silt coal shown in Table 3 do not show any sharp definition as in the case of the single substance, sand, of Table 1, for the reason that each column of the classifier collects particles having similar mass

surface relations, large particles of phosphate or of coal settling together with smaller particles of sand. In both cases the clays and muds are removed with a high degree of effectiveness. De-sliming of mixtures in which the slimes are worthless can be very completely accomplished with this classifier.

As there are no moving parts except the valve member, and since this is practically indestructible, this device promises continued operation without shut downs for repairs.

Rock Products in Illinois

REPORT of Investigations No. 140, "Illinois Mineral Industry in 1947," compiled by the State Geological Survey Division, reports that in 1947 the limestone and dolomite sold or used by producers amounted to 14,687,000 tons, valued at the plants at \$17,164,000, a decrease of 9.3 percent in amount and 2 percent in value from the previous year. Stone for metallurgical uses and flux, for limestone whitening, and for other industrial uses showed increases in both amount and value, ranging from 2.7 percent to 8.2 percent in amount, and from 14.9 percent to 28.2 percent in value. Miscellaneous

filler, other than asphalt filler, declined 50.3 percent in amount, but increased 20.7 percent in value; concrete and paving, non-commercial operations, showed a small decrease in amount, and a slight increase in value. All other uses declined in both quantity and value.

The amount of agricultural limestone (ground limestone and dolomite) used for soil improvement in Illinois during 1947 amounted to more than 5,180,000 tons. This was 412,000 tons less than that used in 1946, but there was an increase of approximately 11 percent in value over 1946, and Illi-

nois continued to rank first among all the states in the amount of liming material used for soil treatment. The total quantity of agstone used in Illinois during 1947 amounted to 7.4 percent less than that of the previous year. That produced in Illinois and marketed in other states declined 40.7 percent, while the amount produced in other states and used in Illinois increased 26.5 percent.

During 1947, sales of cement by producers in Illinois amounted to 7,516,000 bbl., valued at the plants at \$14,165,000. This was an increase of 6.3 percent in amount and 14 percent in value over 1946. The largest percentage increase was in "other special portlands" (low-heat, waterproof Portland, and air-entraining cements). High early strength was the only cement which declined in both amount and value. The quantity of cement sold or used by producers in Illinois in 1947 attained the highest figure since 1930 when shipments established an all-time high record.

Sales of lime by producers in Illinois in 1947 amounted to 223,800 tons, valued at the plants at \$1,961,400. These figures represent the output of five plants, as against that of seven plants which reported in 1946. Of the tonnage sold in 1947, 85.4 percent was quicklime and sintered dolomite, and 14.6 percent was hydrated lime.

Total lime decreased 20.1 percent in amount and 17.1 percent in value from 1946, while the average price increased 31c per ton. Quicklime and sintered dolomite decreased 20.6 percent in amount and 18.1 percent in value from the previous year, and hydrated lime declined 17 percent from 1946 in both amount and value.

Sales of quicklime for chemical and industrial uses increased 91.8 percent in amount and 105.5 percent in value over 1946. Under this classification is included lime for water purification and softening, sewage and trade-wastes treatment, insecticides, fungicides and disinfectants, petroleum refining, tanneries, glue, grease, paper manufacturing, and for other purposes.

Ganister is a siliceous material found in Union and Alexander counties of southern Illinois, and is used for refractory purposes. Sales of this material in 1947 increased 89.2 percent in amount and 85.4 percent in value from the previous year.

Sandstone and miscellaneous stone are produced in various parts of the state for road work, and for foundations, riprap, and rubble, mostly by non-commercial operations. During 1947 sales increased 95.8 percent in amount over 1946, and 66.4 percent in value. Sandstone used for road work accounted for this large increase.

Total sales and uses of ganister, sandstone, and miscellaneous stone by producers in Illinois show an increase of 95.5 percent and 72.1 percent in value over 1946.

Fundamental and Applied Research

National Lime Association convention reveals great progress in scientific research, and its application is bringing results in enlarged markets. Diversified program aimed at improved products and applications

THE EDITOR has had the privilege of attending a number of meetings of the lime industry and has in past years felt, along with many other observers, that greater emphasis needed to be given to research and market development. The thirty-first annual convention of the National Lime Association, held at Hot Springs, Va., May 5-7, was a noteworthy meeting, and incidentally the best we personally have attended, because the various reports were excellent and revealed that substantial progress is being made through research that is bringing results and will continue to contribute to product improvement, cost reduction and extended markets. The budget approved for the year ahead allocates more than 50 percent of outlay for research and promotion, so the association intends to continue a sound policy.

In addition to the reports on research and other activities, all the speakers were of outstanding qualification and their prepared talks were of more than average calibre. That was the opinion of the members and others in attendance, according to our observations. Much progress has been made by the association, and the officers and others who participated in arranging the convention are due a great deal of credit for an extremely informative and enjoyable three-day meeting.

The social side was by no means neglected and a delightful program of entertainment was arranged, including a bingo party and the traditional reception and annual banquet. All three afternoons were left open for golf or other diversion, although the morning business sessions each day infringed a bit into the early afternoon because of the interest shown.

A highlight was the unusual privilege of hearing an address by William F. Halsey, Admiral (Ret.), United States Navy, at one of the general sessions. Admiral Halsey spoke informally for two hours on experiences and events from the time of Pearl Harbor until the end of the war with Japan. His talk revolved about many of the highlights of naval and air battles, which were critical to the winning of the war. The Admiral proved to have a keen sense of humor and he interjected many humorous sidelights involving incidents and men in tracing the developments that led to reaching Japan and the eventual surrender. We guess that the entire attendance of 109, including the 35 ladies who were invited, was present to hear Admiral Halsey.

The Admiral stayed throughout the convention and attended all the scheduled events. At the reception, each person had opportunity to chat with him informally. He was present at the

banquet and was one of the winners at the bingo party. He good-naturedly served as one of the "stooges" for Dr. Giovanni (self-styled world's greatest pick-pocket) who was the "major domo" at the banquet entertainment. Others of Dr. Giovanni's "stooges" were Melvin H. Baker, National Gypsum Co.; E. I. Williams, Riverton Lime and Stone Co.; Wallace E. Wing, Marblehead Lime Co.; E. W. Williams, H. E. Millard Lime and Stone Co.; Amos B. Miner, National Gypsum Co.; and K. B. Woods, Purdue University. Needless to say, they all lost their watches and wallets to say nothing of Amos Miner's suspenders.

E. I. Williams, who, incidentally, learned to fly an airplane at the age of 52, provided transportation for the Admiral via the Hot Springs airport atop Bald Knob mountain.

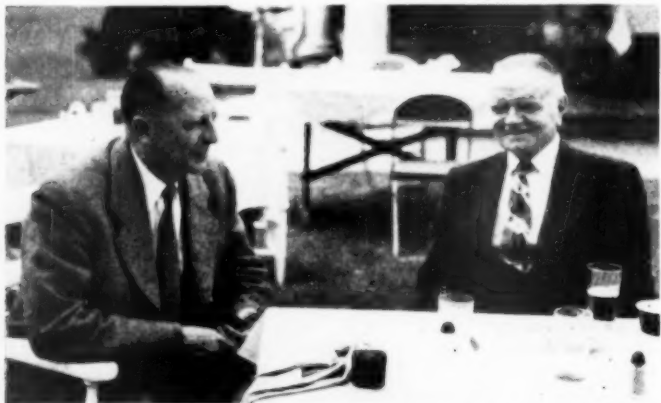
Honorary Member

Burton A. Ford, St. Regis Sales Corp., Allentown, Penn., was elected to honorary life membership in the National Lime Association, the third honor so bestowed, in recognition of his contributions of many years to the advancement of the association. Mr. Ford served the association as its secretary and manager back in the 1920's and has been an active supporter and a participant at all its conventions since that time. Mr. Ford and his company for many years have provided entertainment as well at these conventions and he, with John F. Gruber, also of St. Regis, put on their traditional hospitable party to which all were invited.

Program

The convention opened with a business session under the chairmanship of H. D. Brigstocke at which the election of directors was announced, the minutes of the 1948 convention were dispensed with, the winners of the 1948 N.L.A. Safety Competition were given recognition and Robert S. Boynton, general manager and treasurer, presented a report on association accomplishments. • E. I. Williams presided over a general session immediately following, covering legislation, lime in agriculture and Admiral Halsey's address.

Following a business session the second day, four papers were presented in the trade waste-construction



E. I. Williams, Riverton Lime & Stone Co., left, has an after-lunch chat with Admiral William F. Halsey

session. The meeting concluded with a research session under the chairmanship of Prof. Walter C. Voss, head, Department of Building Engineering and Construction, Massachusetts Institute of Technology.

Officers

Wallace E. Wing, president, Marblehead Lime Co., Chicago, Ill., was elected president and chairman of the board of directors to succeed H. D. Brigstocke. Robert S. Boynton was re-elected general manager and treasurer, and Miss Gladys L. McBee was elected secretary of the association.

The board of directors elected for the 1950 fiscal year is as follows: District 1, C. C. Loomis, New England Lime Co., Adams, Mass.; District 2, Bolton L. Corson, G. & W. H. Corson, Inc., Plymouth Meeting, Penn., and E. D. Williams, H. E. Millard Lime and Stone Co., Annapolis, Penn.; District 3, F. J. Collins, the Kelley Island Lime and Transport Co., Cleveland, Ohio, A. B. Miner, National Gypsum Co., Buffalo, N. Y., and Reed C. Bye, Warner Co., Philadelphia, Penn.; District 4, John J. McInnis, Eagle Rock Lime Co., Eagle Rock, Va.; District 5A, W. W. Sprague, National Mortar and Supply Co., Pittsburgh, Penn., and Fred Witmer, The Ohio Hydrate and Supply Co., Woodville, Ohio; District 5B, Russell Rarey, The Marble Cliff Quarries Co., Columbus, Ohio; District 6, L. M. Carmouche, Dow Chemical Co., Ludington, Mich.; District 7, Wallace E. Wing, Marblehead Lime Co., Chicago, Ill.; District 8, M. Brisch, Jr., Rockwell Lime Co., Manitowoc, Wis.; District 9, Henry LaLiberte, Cutler-Magner Co., Duluth, Minn.; Districts 10 and 11, K. L. Hammond, Keystone Lime Works, Inc., Keystone, Ala.; District 12, Paul Sunderland, Ash Grove Lime and Portland Cement Co., Kansas City, Mo.; District 13, G. E. Robinson, Austin White Lime Co., McNeil, Texas; District 14, Paul H. MacMillin, Roche Harbor Lime and Cement Co., Roche Harbor, Wash.; District 15, Kennedy



Three St. Regis representatives, left to right: Logan G. Hill, John F. Gruber and Burton A. Ford

Ellsworth, United States Lime Products Corp., Los Angeles, Calif.

The executive committee comprises H. D. Brigstocke, Kenneth L. Hammond, Bolton L. Corson, Amos B. Miner, Reed C. Bye and Wallace E. Wing, chairman.



Past Chairman H. D. Brigstocke, left, and chairman-elect Wallace E. Wing, Marblehead Lime Co.

Safety Competition

Winners of the 1948 N.L.A. safety competition were announced by Miss

Gladys McBee, who had a very encouraging report to present. According to tentative figures, the year 1948 was the best year in history from the standpoint of accident frequency and severity. The frequency rate was 21.89 as compared to 32.63 in 1947 and the severity rates will be the lowest yet.

Six plants operated throughout 1948 without lost-time accident. Winners in the quarrying and calcining division, within excess of 100,000 man-hours worked, were the Galloway, Mo., plant of Ash Grove Lime and Portland Cement Co. and the Strasburg, W. Va., plant of Standard Lime and Stone Co. In the same classification, for plants operating less than 100,000 man-hours, the winners were the Thomasville, Penn., plant of The J. E. Baker Co. and the Thomaston, Maine, plant of Lawrence Portland Cement Co. Winners for the underground operation classification were the Bakerton, W. Va., plant of Standard Lime and Stone Co. and the Ludington, Mich., plant of Dow Chemical Co. Over 7 million man-hours of operation were represented in the competition.

General Manager's Report

Robert S. Boynton, general manager and treasurer, in his report "What the Association is Accomplishing," summarized the activities of the past year. The Association, through his office and a special committee, has been actively working in Washington in attempting to secure percentage depletion for the lime industry on the basis of stone of special properties being required for the production of chemical and metallurgical lime. There will soon be a hearing on a bill, H. R. 2537, introduced before the House Ways and Means committee and Mr. Boynton feels reasonably optimistic on the outcome judging from the reactions of some congressmen. He stressed the importance of the savings that would accrue to the industry if its case should be won.



Relaxing with their cigars were Edward L. Kinsella, left, and David Follett, New England Lime Co.



Washington staff of the N.L.A. snapped informally on one of the porches, left to right, are: Jane C. Wojcik, Robert S. Boynton and Gladys L. McBee

Three new bulletins on the use of lime in trade wastes were published during the year and, according to Mr. Boynton, they have been well received by chemical and sanitary engineers. Two were produced by his office and the third by Dr. Willem Rudolfs on the subject of handling lime in its application and storage. Literature on lime in construction is to be brought up-to-date in 1949. A new book planned on "liming" will be from the results of a national research program in which five agricultural experiment stations have participated.

Lime as Soil Stabilizer

Much work has been done and is in progress on the use of lime as a soil stabilizer, since the Department of Highways of Texas introduced the practice a year ago. According to Mr. Boynton the use of lime for that purpose has spread even into Canada and is being practiced in California, Arkansas and Georgia. The Virginia Highway Department will undertake field tests this year and other states are considering it. The West Virginia and Kansas highway departments are starting research work on lime as a stabilizer in their soils laboratories. Thousands of engineers have now become familiar with this application for lime.

Mr. Boynton's office has been doing a great deal of work during 1948 in connection with building codes, standards and specifications. He said that participation in the Association's wage rate survey is growing. He called attention to improvements in the publication "Limeographs" and invited the members to submit contributions. More emphasis is being given in this publication to research including marketing research. Mr. Boynton concluded by paying compliment to Miss Gladys L. McBee for so ably taking the place of Roma Turpen who had resigned during the year after 20 years of outstanding service.

Basing Points

In a discussion, "Legislative Aftermath of the Basing Point Decisions," Association Counsel Abram F. Myers commented on the serious implications should industry be compelled to continue pricing f.o.b. plant plus transportation in order to comply with law, and outlined the important points in legislation pending in Congress. He stressed the serious effects on all industries, and particularly for those which market bulky, low-priced commodities, should the Supreme Court decision continue to be upheld. Business efficiency thrives on competition, he pointed out, in touching upon monopolistic practices that have actually been created as a result of the decision outlawing basing point pricing.

Mr. Myers expressed as startling the interpretation given to price discrimination under provisions of the Clayton Act, which is based on variations in a manufacturer's net realization on a deal rather than on prices charged respective customers. In commenting on uniform pricing such as was hit at in the cement industry by

the Federal Trade Commission, he mentioned that customers often asked suppliers to meet the prices charged by others, which is an indication not of conspiracy to fix prices but of competition.

Mr. Myers believes that the Myers bill which would merely declare a moratorium until July 1, 1950, likely will pass in this Congress. This bill, which would be in effect on application of certain industries, would not affect the law as it stands and would have no bearing on any order in effect before the date of decision on this bill.

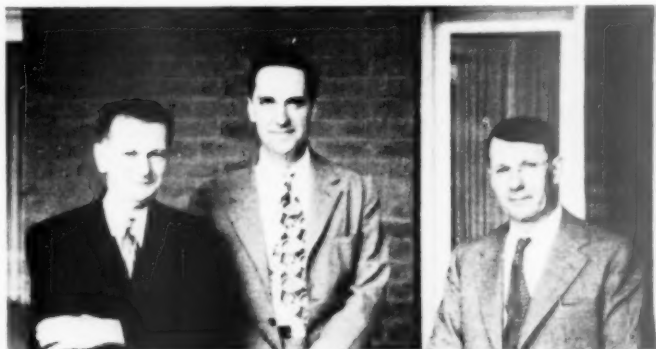
Bill No 236, the Johnson Bill, is intended to be permanent legislation and would be favorable to industry but, said Mr. Myers, this bill will be delayed and the outcome in Congress is subject to doubt. Among other things, the bill would not hold pricing methods of a group of companies to be illegal merely because they charge uniform prices whether uniform in geographical zones, through averaging prices or through freight absorption.

In the event there is evidence of conspiracy in establishing prices the F.T.C. would be empowered to issue an order establishing f.o.b. prices plus freight as a penalty effective for a given period of time. Price would be defined as that contracted for between buyer and seller.

Lime in Agriculture

Two papers were presented on the subject of lime in agriculture. One was by George D. Scarsett, Director of Research, American Farm Research Association, Lafayette, Ind., entitled "Lime and the Way of the Land"; the other "The Lime Problems in Pennsylvania Agriculture and Steps Leading to Their Solution," by Dr. F. G. Merkel, Professor of Soils, The Pennsylvania State College, State College, Penn.

Mr. Scarsett's talk was an inspirational presentation designed to stimulate greater sales through intelligent merchandising based on the theme of utilizing the results of research to sell



Three researchers at the convention were Prof. Walter C. Voss, M.I.T., left; L. John Minnick, G. & W. H. Corson, Inc., center; and Dr. F. G. Merkel, The Pennsylvania State College



Three from National Gypsum Co., left to right, are: A. B. Miner, Melvin H. Baker and John C. Best

the farmer on the need for better farming efficiency. Mr. Scarsett emphasized that producers of liming materials are in a choice spot since lime must be considered if good farming be the objective in order to attain greater production from fewer acres at lower cost. There is a great need for more efficiency in farming and,

he said, there is a real opportunity to sell liming materials by selling good farming practices. He likened farming to industry in that profits are desirable and necessary and said that

there are many products of research that can be put to good use through creative thinking and merchandising along the pattern he suggested. With the nation's population increasing and soil resources going in the reverse direction, he believes that liming materials should comprise a principal product for a producer and need not continue in the by-product classification.

Dr. Merkle's paper was presented before the research session and dealt largely with studies of soils in Pennsylvania and experiments to increase their productivity. However, his main point was that liming is essential down into the subsoils and his findings would indicate the need for more application of liming materials nationally in order to accomplish that objective.

He used the terms "deepening top soil" and "increasing the root range" to introduce his subject. A common assumption, he said, has been that

(Continued on page 141)

Some Practical Suggestions On Waste Acid Treatment

Lime industry can anticipate expanding market in trade waste field. Products should be appraised and fitted to specific applications in order to be effective

By C. J. LEWIS*

MY REMARKS on waste acid treatment are intended to be practical and it is hoped they will leave an impression which will be of use in the field. A certain amount of numerical accuracy as well as accuracy in defini-

tion will be sacrificed in order to develop a flexible approach to waste acid treatment in general and waste pickle liquor treatment in particular. The current nationwide interest in the improvement of public waters indicates that many wastes now enter-

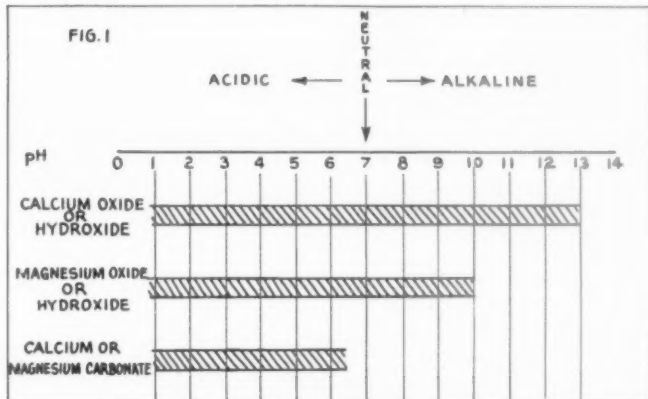
*Technical Director, Warner Co., Devault, Penn.



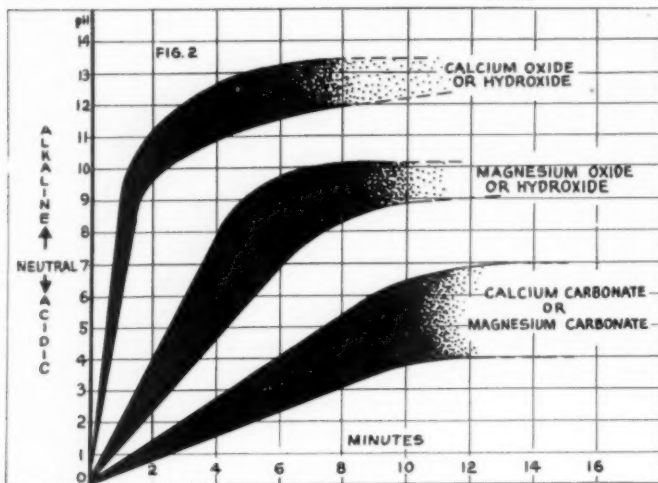
Burton A. Ford, St. Regis Sales Corp., poses with his honorary life membership certificate



Paul Sunderland, Ash Grove Lime and Portland Co., with safety certificate won by his Gallows, Mo., plant



Generalization showing relation of pH scale to what may be expected of calcium and magnesium products



Author's visualization of differences in reaction rates, generalized, for calcium and magnesium oxides and hydroxides and for corresponding limestones

ing public waters will need some degree of pre-treatment in order to reduce their pollutive nature. Industrial wastes, though by no means the major cause of public water pollution, are of particular interest to the lime industry because so many industrial wastes are acidic.

In many cases lime treatment of the acid waste will be found to be the most practical means of complying with pollution abatement requirements. Because of their varied nature, the waste acids of industry are not amenable to standardized treatment procedures as in the case of domestic sewage. It is a generally accepted philosophy among those charged with the disposal of industrial wastes that each disposal installation must be tailor-made to fit the particular circumstances involved. There is no obligation on the part of the lime industry to develop or have available methods or processes for treating industrial wastes simply because lime may be used; however, it does seem reasonable to expect that the lime industry be able to express an accurate appraisal as to the proper lime product to use in treating an acidic waste under any given set of conditions.

Effective pH Ranges

In approaching acid disposal problems involving the use of lime, we are primarily interested in two basic considerations: first, the pH range over which the lime treatment is to take place; and second, the minimum time available for the reaction between lime and acid. I will confine my remarks to these fundamentals.

Many of you are familiar with the so-called pH scale. This scale indicates the concentration of hydrogen ions which, in turn, are a measure of acidity. This scale is sometimes con-

fusing because it is logarithmic and the great difference in acid concentrations at various pH's is not always easily understood.

Now, in acid waste treatment involving the use of a liming material, it is very important to know the final pH expected in the system after the lime addition. The initial pH is usually determined by the nature of the waste which, in turn, is the result of a particular industrial process; and usually there is small likelihood that much can be done to change the initial pH one way or the other. By the time industry has discarded the acidic materials as a waste, the possibility of recovering acid values from the waste has usually been exhausted. However,

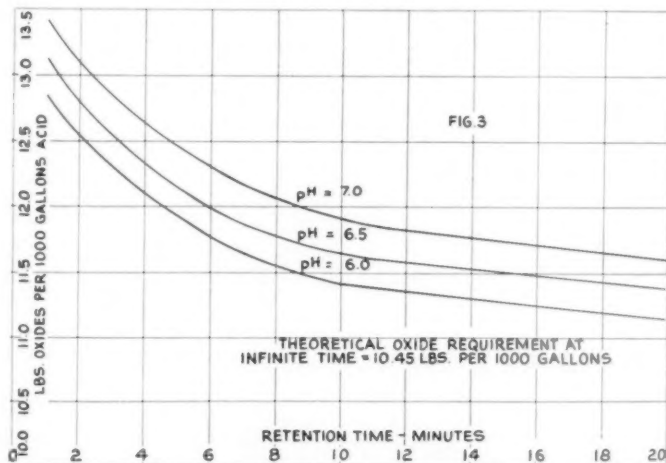
the final pH of the system to be lime-treated is often dependent on federal, state or local pollution abatement requirements. Effluents acceptable in one state are often objectionable in another, and this may vary from locality to locality within the same state. Furthermore, the final pH of the system is often complicated by the presence of metals which may or may not precipitate and form hydroxides at the final pH desired. The presence of such metals in the solution often requires that the final pH of the system be adjusted to either remove the metals or retain them in solution, depending again upon pollution abatement requirements.

For relating the pH scale to what may be expected of the calcium and magnesium products of interest to our group, Fig. 1 constitutes a generalization. Calcium oxide or hydroxide is practically effective over the entire range of pH values. Magnesium oxide or hydroxide in an active form is effective from the lowest pH values to a pH of about 10. Limestones, both high calcium and high magnesium types, are effective in the acid range of pH values and are generally considered ineffective above pH 6.

Time Factor

However, the generalizations in Fig. 1 can be very misleading unless related to the second fundamental consideration previously mentioned, which is the time available for the acid-lime reaction.

The reaction rates of calcium oxide or hydroxide differ sharply from those of magnesium oxide or hydroxide, particularly on the alkaline side of the pH scale; and the reaction rates of the corresponding limestones likewise are much different from the limes. Such differences in reaction rates are generalized in Fig. 2.



Original data developed in laboratory showing time requirement for neutralizing 1/4 percent sulphuric acid using a dolomitic pebble quicklime slaked and slurried

Now, obviously, the concern having an acid waste and desiring to treat same to a pH of 8.5 would not consider limestone alone as the neutralizing agent. On the other hand, if the end pH requirement is pH 6, limestone might be given serious consideration if ample time is available to develop a pH of 6 with the relatively slow-acting limestone. However, if the rate of flow of the acid waste is high and space is limited, either or both of which considerations can result in a few seconds or a few minutes available for the lime-acid reaction, high calcium lime may be the wisest selection, particularly if a pH value in excess of 7 is the goal. But if the waste contains sulphuric acid, which is so often the case, and sufficient reaction time is available to efficiently achieve a pH of about 7, dolomitic lime may be strongly preferred in order to take advantage of the solubility of magnesium sulfate. Finally, the location of the acid waste may be such that for economic reasons it is highly desirable to utilize a particular lime or limestone. In this case, those responsible for the waste disposal installation may be justified in incurring higher equipment costs in order to provide for the necessary reaction time or sludge removal in order to utilize the cheapest alkaline agent.

pH and Reaction Times

A practical application of the two basic fundamentals of pH value and reaction time are illustrated in Figs. 3 and 4. Fig. 3 shows the quantities of dolomitic quicklime slaked and slurried which, in this particular acid, developed the pH values indicated and at the rate indicated. Through contact with the proper pollution abatement authorities it was first established that a final effluent pH of 6.5 was entirely acceptable. It was also deemed desirable to take advantage of the solubility of magnesium sulfate, and hence a dolomitic lime seemed preferable from every angle. However, first attempts to apply the dolomitic quicklime to the waste were not to successful, probably for the reason illustrated in Fig. 4. The pH control point in terms of flow rate was about 60 sec. removed from the point of lime addition. Hence, in developing a pH of 6.5 in about a minute, a substantial excess of lime was being added. The calcium component of the dolomite, as is usual, reacted first in the acid; and since the lime was in excess, there never was sufficient acid for the magnesium oxide to react with. Hence, magnesium oxide appeared in the sludge.

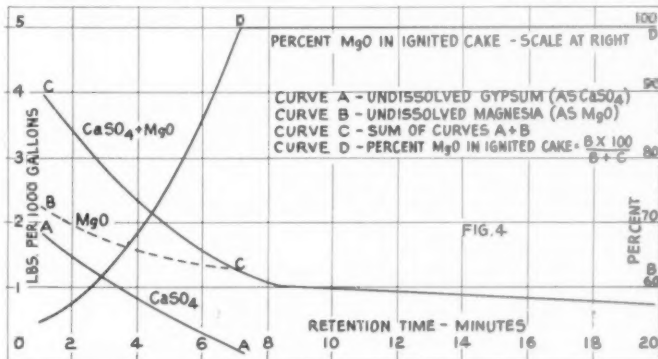
However, because the main portion of the reaction was with the calcium component, the overall amount of sludge formed was very high because of the calcium sulfate. Hence, by difference, the percentage of magnesium oxide in the sludge was low although the overall amount of sludge was high, and it was at first difficult to perceive

that poor lime efficiency was to blame. But, applying the information from Fig. 3, it was apparent that a longer retention time must be provided, and this was done, so that the point of pH control was about eight minutes removed in flow from the point of lime addition. This, then, resulted in complete utilization of the available calcium component of the dolomitic lime and also complete utilization of the magnesium component. The amount of calcium sulfate sludge formed was greatly lowered because of the small but useful solubility of calcium sulfate. Little remained by way of solids, therefore, except impurities and a small amount of unreacted magnesium oxide representing the slight excess of lime used; hence, the sludge became almost entirely magnesium oxide, and lime utilization or efficiency almost 100 percent.

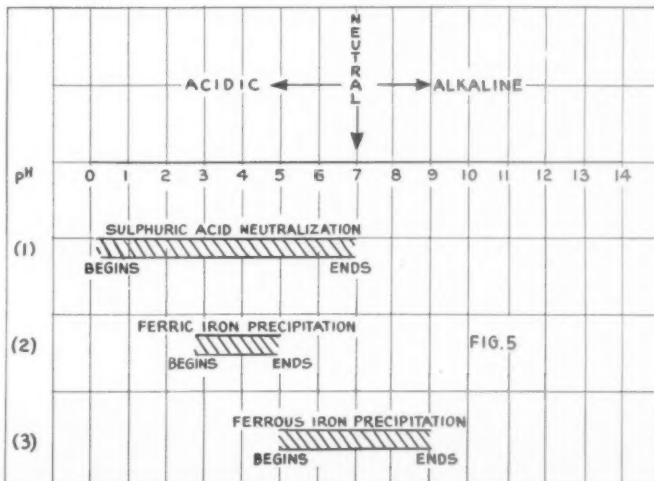
In applying the two fundamentals

of pH and reaction time to waste pickle liquor from the steel industry are: sulphuric acid, ferric sulfate and ferrous sulfate. Appraised against the pH scale, the three components behave about as indicated in Fig. 5. Obviously, high calcium quicklime or hydrated lime will completely neutralize as well as precipitate all iron from pickle liquor, leaving a solution saturated with calcium sulfate. Dolomitic quicklime or hydrated lime will do likewise but with this complication: in the earlier stage of the lime addition magnesium sulfate goes into solution, but in the later stages, say when the pH is on the alkaline side, the calcium oxide component of the dolomitic lime present reacts with the magnesium sulfate in solution to precipitate magnesium hydroxide and gypsum. In other words, the dolomitic quicklime

(Continued on page 141)



Theoretical presentation of conclusions which may be deduced from data of Fig. 3. Calculated sludge compositions when a pH of 6.5 is desired, neglecting impurities, are shown. Gypsum is calculated to the ignited basis and magnesia calculated as oxide. Assumed solubility of gypsum in solution as 210 grams CaSO_4 per liter



Graph showing that there would be no need to carry pickle liquid treatment to a pH of 8.5 if ferrous iron could be converted to ferric form, which is often feasible

The Modern Vertical Lime Kiln

Functions of the preheating, calcining and cooling zones in arriving at optimum height of kiln for maximum output and low heat consumption are discussed

By GORDON R. LACY*

A LIME KILN is a heat transfer apparatus that depends on the efficiency of its various parts to make up an overall picture of how effective it is. Proper zone heights, method of introduction of fuel, and manner of operating the kiln all add to or detract from the final results which are only expressed in dollars and cents cost to produce each ton of burned lime.

In a vertical lime kiln there are three zones contributing to the efficiency. From the point where the fuel is introduced up to the point where the kiln gases are cooled to a temperature where they are below the calcining temperature is obviously the calcining zone where the lime is actually made. Above this zone the heat available is of "low" elevation capable only of preheating the stone so that a lower temperature differential will exist between stone and heat carrying gases when the stone moves into the calcining zone.

Working with high calcium stone, the line between the two zones is where gas temperatures go below 1500 deg. F. which is the dissociation point of CaCO_3 . With a dolomitic stone the temperature line is at about 1000 deg. F.

Preheating—Calcining

In either case, the combined height of the two zones should be such that the rate of heat transfer at the top of the preheating zone is lowered to a practical limit, beyond which the economics of the installation do not warrant cost of increasing the kiln height and of providing fan power to pull the exhaust gases through the greater column of stone. This combined zone height is the same for a kiln of 50 tons capacity as for one of 90 tons capacity using the same quality and size of stone. For a high calcium stone it should be about 34 feet; for dolomite, some less.

Cooling Zone

The third zone, and probably the most effective in contributing to kiln efficiency, is the cooling zone which extends downward from the point of fuel entrance to the point where primary air is introduced to the kiln.

If the kiln operation depends on the exhaust draft to pull primary air into the kiln, ordinarily this is done through the draw gates. If forced in by a separate fan, the point of entrance would be the distributing duct used at a level somewhat higher than the draw gates. It is in this zone that sensible heat of the burned lime is recovered before the lime leaves the kiln, providing a hot primary air for combustion when it meets the fuel gas at the bottom of the calcining zone. The primary air temperature may reach the calcining temperature of the stone without help from combustion of fuel if the quantity of primary air is not too much in excess of fuel combustion requirements, thus allowing the full use of fuel heat value for calcining rather than bringing the inert part of primary air up to a "high" elevation temperature. Complete absence of a cooling zone could result in as much as one-third greater fuel requirement for the same lime tonnage.

Thus, the aim should be for complete combustion with minimum excess air in the calcining or "hot" zone.

Gas Producers

Assuming producer gas as a kiln fuel, it can be generated from several original fuels—coal (of various grades), wood, bagasse, lignite, and others. Some are more difficult to handle than others and may require modification of producer equipment in order to use them satisfactorily. Local conditions of cost and availability, of course, determine the fuel to be used.

The gas producer can be one of two general types. First is the so-called "mechanical" producer capable of gasifying large quantities of fuel per day, usually far more than a single kiln requires. The other is the "integral" type with stationary body, whose gasification capacity can be more closely correlated to the requirements of a single kiln. In addition, it can be brought into the "mechanical" class almost as completely as the "mechanical" producer as far as feeding of fuel and removal of ashes is concerned. For small plants with one or two kilns of 40 to 60 tons capacity each, the integral producer is by far

the better answer to the problem. In a plant of greater capacity, the mechanical producer may be the answer. However, it should be kept in mind that a single producer serving several kilns will require long lengths of large gas mains plus dust collector and several soot legs which are eliminated in the use of integral producers. Also, cross control of fuel to individual kilns from a central producer is far more difficult than in the case of integral producers. In the latter case the individual producer operation can be regulated to serve each kiln best, while in the former, gas pressures or volumes requiring changes in one kiln may upset the same factors in another kiln on the same line.

Mechanical producers, with their heavy ash bed and comparatively thin raw fuel bed, require higher blast pressures and continuous fuel feeding and more careful operation to hold gas temperatures to a reasonable minimum. In the Azbe integral producer, a shallow ash bed of only a few inches plus a heavy raw fuel bed require less blast pressures and give a cooler gas. Also the thicker bed tends for more even gas production even with intermittent fuel feeding and decreases the possibility of hot spots blowing through unexpectedly.

Here again we come to an important factor, that uniformity of gas flow to the kiln should be maintained so that uniformity of primary air can be established with minimum excess air.

Up to now we have established that a constant flow of gas and of primary air should be the aim. However, if they do not combine properly, the efforts used up to this point are not being fully used. Thus, the next step is to bring the two together as intimately and uniformly as is practical.

All the gas can be burned quite easily by using a great deal of excess air, but the aim should be to use available heat for calcination rather than for heating excess air. Thus the arrangement for introduction of fuel should be such that sufficient air is obtained with minimum excess for combustion at or near its entrance point. Gas going into the kiln at one point and air entering the same level in another spot may eventually meet higher up in the kiln and burn, but that heat

*Consulting Engineer, Azbe Corporation, St. Louis, Mo.

CALCINATION

generated is not being applied efficiently. Air coming through the draw gates or through a forced primary air duct will usually distribute itself quite well by the time it has reached the gas entrance level. It is here that the Azbe kiln provides for controlled entrance of fuel through a center burner or side burners or a combination of the two to secure good mixing. Spacing of the ports for distribution, sizing of ports for proper gas velocity, and means to vary the size or number of ports being used and their location relative to the kiln shaft, all enter into the picture. Also, consideration must be taken of the cleanliness of the fuel and, if necessary, means be provided for cleaning the ducts and ports. These factors, considered in an attempt to meet each rising air stream, can be upset if the stone is of a friable nature, tending to produce an abnormally large percentage of fines as it travels through the kiln. The fines tend to accumulate in masses or layers which throw the air or gas stream off its normal upward course and thus destroy the equal distribution desired at the beginning of the hot zone. A sound stone, well sized does not present this problem but poor sizing of a good stone can have a similar effect.

Mechanical Drawing

To overcome segregation of fines, mechanical drawing can be used to good advantage. This infers a means for drawing the kiln continuously or at least very frequently, resulting in frequent rearrangement of particle positions throughout the whole charge. Also, mechanical drawing moves a friable material more gently through the kiln than the less frequent manual draw method might, and at the same time probably keeps the fine, more readily calcined particles moving faster than the main body of the charge.

Two objections to mechanical drawing may arise. First is that larger pieces will not feed too uniformly. However, in a 50-ton kiln, the rate of discharge is such that this is not serious. The second objection is that local hangs may occur and upset gas passages through the charge. The Azbe kiln is provided with adequate, properly located trimming openings for detecting and breaking these hangs to maintain a solid condition of the charge. Tendency to hangs is less pronounced as stone sizes used are smaller and hangs usually are a result of excessive heat rather than a mechanical bridging action.

Gas Flow

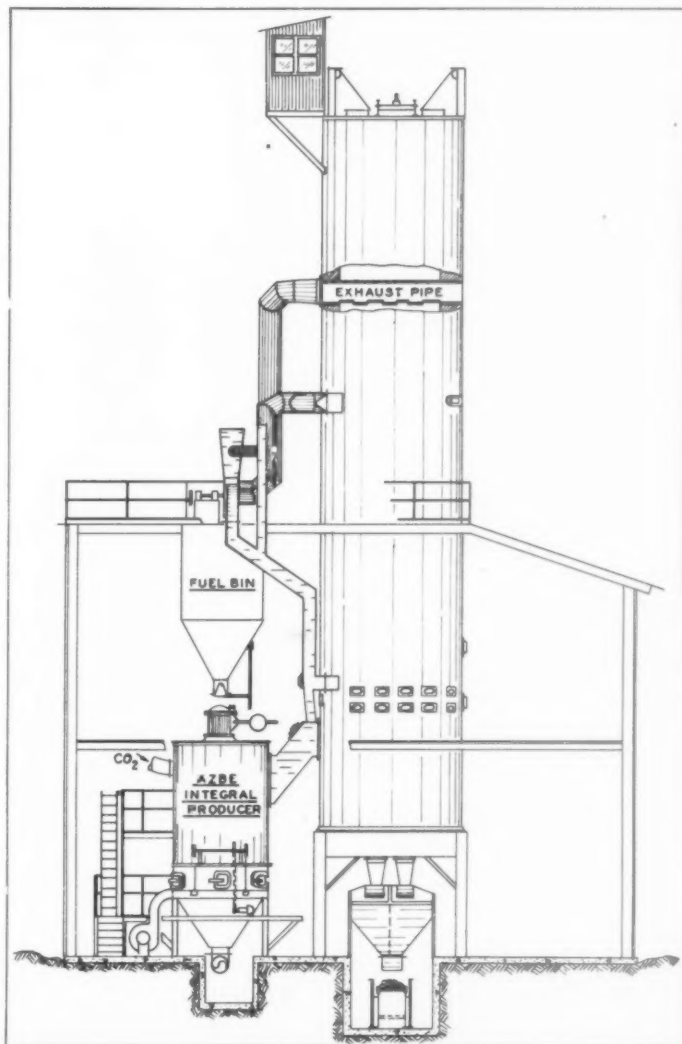
Up to now we have considered only the use of a fuel plus primary air, from which the products of combustion plus excess air are depended on as a heat carrying and distributing medium. To hold excess air to a rea-

sonable minimum means that the overall volume is at a minimum also, and the lower it is, the more delicate becomes the problem of maintaining an equal distribution over a horizontal section of the charge. To overcome this, the return of kiln gases from higher up in the kiln is resorted to, a system commonly known as "recirculation." It has a threefold purpose. First, is to create more turbulence and better mixing as it is introduced as near the fuel ports as is practical to mix primary air and fuel better. Second, is to serve as a tempering medium to keep hot zone temperatures from becoming excessively high.

Third, is to act as a means of adding more volume to the original heat-carrying gases in order to create better distribution, less channelling and to reach remote corners more readily.

The Eldred system was a forerunner of this system but had some objections that hindered its use. Exhaust gases from the kiln top were used and were initially comparatively cool, having passed through the preheating zone, and were diluted with a considerable quantity of top leakage air. This being brought back into the hot zone introduced another excess air factor and, while cooling

(Continued on page 134)



Gas producer application to vertical lime kiln

Exfoliation of Perlite

SEVERAL COMPANIES in the west are considering the establishment of exfoliation plants in the eastern section of the United States and supplying these plants with a prepared, crude perlite. There are technological problems in connection with the heating and expanding of natural perlite, the main one being to produce as coarse a product as possible with a minimum of extreme fines. Uses for the latter are not as far along as some of the uses developed for the coarser grade. As the coarser grade, materials in the minus 10-mesh, plus 30-mesh range are referred to.

Perlite is a volcanic rock found in profuse quantities in Nevada, Arizona, central Oregon and more recently in west central Utah. One western operator who secures his crude rock from Arizona simply heats the material in a rotary kiln to sufficient temperature to cause the ground material to expand. Another producer finds that by slowly pre-heating the crude rock before subjecting it to the higher temperature, less fines are produced. A third operator finds that by keeping the water content of the crude perlite at around 3 percent, the optimum expansion condition is obtained, so the practice is to blend the crude perlite with various grades (2 to 6 percent water) to get the desired grade. Most of the furnaces are so designed that a current of air will carry out the exfoliated material and deliver it to suitable cyclone dust collectors, sometimes two in series, so as to prepare a coarse and a fine aggregate. This can be readily understood when it is realized that expanded perlite has a weight of around 5 lb. per cu. ft. and an ordinary barley sack will hold about 12 to 13 lb. of the material.

Expanded perlite is finding an increasing use as a plaster aggregate. It can be used with concrete for such items as roofing slabs, or where high compressive strength is required. It has high insulation properties and usually is pure white in color. It is one of those rock minerals with very interesting properties, and producers will no doubt find many more uses for this product.

The discovery of perlite, underlying a deposit of pumice in central western Utah, was made by Byron A. Ray. Mr. Ray is now shipping a limited amount of perlite to Exolite, Inc., Salt Lake City, Utah, where an exfoliation plant has been established. The crude perlite is ground by commercial grinders in the Salt Lake area. The plant is about the simplest the editors have encountered and consists of a vertical cylindrical furnace about 4 by 4 ft., lined with fire brick. The gas burner flame enters the top of the furnace at a tangent. Ground crude perlite is introduced from a small gravity cone so that the mate-

rial impinges onto the top of the flame. In the bottom of the furnace is an exhaust outlet connected to a small fan. This fan draws the flame and crude perlite into the furnace where in a matter of a fraction of a second the material is expanded and taken out of the furnace to the dust collecting system. The furnace is covered by patents. Capacity is approximately 12 sacks of expanded material per hour. The company is owned by Dave Westwood, Lamar Davis, and J. F. Handley. Delos Baker is superintendent.

Crushing Strength Test For Lightweight Aggregate

ALEXITE ENGINEERING DIVISION, Alexander Film Co., Colorado Springs, Colo., has announced development of a machine to determine the crushing strength of lightweight aggregates. The apparatus consists of a 3-in. dia. steel cylinder, 6 in. high, of walls sufficiently strong to withstand high compressive loads; a baseplate upon which the cylinder rests, and a steel piston (9 in. in length) of slightly less diameter than the cylinder to allow clearance for the piston to move freely up and down inside the cylinder. A pointer is attached to a steel rod near the top. This rod is parallel to the cylinder, at a distance of 1 in. from the shell of the cylinder and is welded to the baseplate. The pointer is centered at zero pointing to a scale attached to the piston. Under compression the scale is read at a compression of 1.2 and 3 in. and calculated to the surface area tested. The aggregate to be tested is placed in the cylinder to a depth of 5 in., tamped lightly with a 1-in. dia. wooden rod. The piston is

then fitted into place on top of the aggregate in the cylinder and the pointer set to read zero on the scale. The piston is then centered on the compression machine and the load applied. Load readings are obtained after the material has been crushed 1, 2 and 3 in., as indicated by the pointer on the scale.

British Cement Production

PORTLAND CEMENT production in Great Britain in 1948 was 8,521,543 tons, the greatest quantity ever produced in one year and 3.8 percent greater than the 8,212,366 tons produced in 1939, the previous best year. Total quantity delivered in 1948 was 3.6 percent greater than in 1939, and 22.5 percent greater than in 1947, also setting a new record. The quantity exported in 1948 was 1,628,200 tons, or 47.4 percent greater than in 1946, the previous best year, and 88.3 percent greater than in 1947.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of April and for the first four months of 1949 have been announced by the Portland Cement Association as follows:

	Square Yards During April, 1949	Awarded During First Four Months 1949
Roads	1,632,678	6,134,037
Street & Alleys	1,967,918	4,343,765
Airports	52,800	189,117
Total	3,653,396	10,666,919

Ceylon Cement

CEMENT IMPORTS were greater in Ceylon during the first quarter of 1948 than during the corresponding quarters in either of the previous two years, and no shortage in this commodity is anticipated, *Mineral Trade Notes* reports. Most of the cement came from Great Britain and Belgium.



Missouri Valley Construction Co., operating in Enders Quarry near Warren, Mont., is producing crushed limestone for a Billings, Mont., sugar company where the material is used in a sugar filtering process. Sizes being produced range from 2 1/4 to 6 in., with the output subjected to extremely selective inspection. Reject material runs close to 50 percent with about 480 usable tons being produced daily. Two General Motors diesel-powered Kochring Dumpsters deliver rock from the quarry to the crusher, making the half mile round trip 64 times in 8 hrs. with an average load of 8 tons. In the illustration, a Northwest shovel loads to one of the Dumpsters

SLY DUST CONTROL

Throughout the rock products field Sly Dust Control Systems are saving thousands of dollars yearly—by improving working conditions, eliminating health hazards, prolonging the life of machinery, reducing cleaning and maintenance costs, and recovering valuable materials. Because of these savings Sly Dust

Control proves a paying investment—often soon repays its cost.



Sly Dust Collectors get all the dust by filtration through cloth. The Collector shown here filters silica dust out of 15,000 cu. ft. of air per minute.

Many dry pans are made dustless by housing completely, as shown, and all dust collected by Sly Dust Filters (illustrated in top view.)

5 SLY SUPERIORTIES

1. Greater filtering capacity because of more filtering cloth.
2. Taut bags (patented) save power and improve dust removal.
3. Bags more easily replaced.
4. Automatic control (any degree) minimizes or entirely removes the human factor.
5. Simpler shaker mechanism results in savings in maintenance and operation.

THE W. W. SLY MANUFACTURING CO.

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Canadian Institute Meeting

TOTAL ATTENDANCE at the 1949 annual general meeting of the Canadian Institute of Mining and Metallurgy, held at the Windsor Hotel in Montreal, Canada, April 25-27, was about 1000. However, the great majority of the delegates were from metal mining companies and, this year, only one business session was set aside for the consideration of industrial minerals. With the growth of the industrial minerals industry throughout Canada, as shown by the annual statistics, it is hoped and anticipated that topics of direct interest to producers of non-metallic minerals will receive more prominence in future Institute meetings. That is the goal of the officers of the Division as expressed in Montreal.

Production

A preliminary report on the mineral production of Canada during 1948, as presented by W. H. Losee of the Dominion Bureau of Statistics before a general session, indicated an all-time peak of \$806.2 million for all minerals. The value of non-metallic mineral production increased 19 percent, from \$54.5 million in 1947 to \$64.9 million.

Asbestos production of 707,843 tons valued at \$41.3 was up 7 percent in quantity and 25 percent in value from 1947 while the gypsum industry again broke its previous record by producing 3,219,469 tons valued at \$5.6 million.

Cement shipments totalled 14.1 million bbl. valued at \$27.9 million in 1948 which compares with the previous record high of 11,936,245 bbl. valued at \$21,968,909 in 1947. Lime production increased from 977,413 tons valued at \$8,542,507 in 1947 to 1,050,841 tons worth \$9,665,198 in 1948; sand and gravel from 56,789,569 tons valued at \$23,114,431 in 1947 to 64,252,068 tons at \$26,785,638; and crushed stone from 10,889,388 tons at \$16,464,749 in 1947 to \$11,451,449 at \$17,080,999. The value of all non-metallics and structural materials has shown a consistent upward trend over the last ten years or more.

Geology and Industrial Minerals

"Geology and Industrial Minerals" was the subject of a talk by A. S. Dawson, Geologist, Canadian Pacific Railway, at a meeting of the Industrial Minerals Division. Mr. Dawson's paper discussed in a general way the application of geological principles in the exploration for, and development of, deposits of industrial minerals. In Canada only under rare circumstances has an intensive search been made for deposits of industrial minerals and, as in this country, there is a need for it. Mr. Dawson cited as a practical example the development of the important potash deposits of New Mexico which was the result of a

program of geological investigation by government agencies and private interests. Mr. Dawson's paper was published in The Canadian Mining and Metallurgical Bulletin, February, 1949, issue, as a reprint.

Asbestos

A paper, "Asbestos for Wet Processes," by M. S. Badollet, described researches on factors that influence the properties of asbestos fibers as used by consumers who employ wet processes. Filtration and porosity tests were touched upon and the effects on these properties and production of adding fiber dusts.

Other papers of interest to producers of non-metallic minerals included a paper, "The Production of Salt Cake," by A. A. Holland; "Some Aspects of Mineral Adequacy" by Edward Sampson; "Structure of the Craigmont Corundum Deposits"; "Radioactive Tracers in Milling Research" by A. M. Gaudin and P. L. deBruyn; "Grinding Practice Today. A Study"; and "Radioactive Raw Materials."

J. H. Robinson, general superintendent of Gypsum, Lime and Alabastine, Canada, Ltd., Toronto, Ontario, was elected chairman of the Industrial Minerals Division. D. F. Hewitt of the Ontario Department of Mines, Toronto, is the new secretary-treasurer of the Division and G. F. Jenkins of Thetford Mines, Quebec, is vice-chairman.

Freight Rates on Crushed Stone

NATIONAL CRUSHED STONE ASSOCIATION, in a recent letter to the industry, enclosed a copy of the verified statement filed by the association in Ex Parte No. 168 in protest of the request of the carriers for further increases in freight rates. The statement pointed out that the average revenue per

ton for stone and rock, broken, ground and crushed in 1947, the latest year for which figures are available, was \$1.20. In 1948, for the first three quarters, the figure rose to \$1.35. Thus it can be seen that in the delivered price of this commodity, well over half consists of transportation charges. In 1947 the class 1 steam railways moved 44,347,523 tons, for \$53,125,761 in revenue. In the "Products of Mines" category, the 1947 total revenue from crushed stone and rock was exceeded only by that of bituminous and anthracite coal and iron ore.

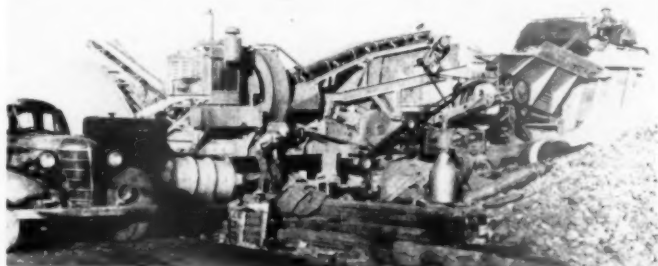
Almost all of the production of way-side pits moves by truck. Almost all of the production of the "non-commercial" operation moves by trucks. The most significant factor in the decision whether to buy from an established quarry—the only kind likely to have rail connections—or to open a new pit, is cost of transportation. A railhead quarry can be literally priced out of the market by the addition of only a few cents to its transportation charges. In an industry where, in the average case, the laid-down cost is more than half transportation, the industry cannot absorb huge freight rate increases, the statement reads.

Asbestos Production

GROWTH of the asbestos cement building materials industry has been traced by the Bureau of the Census in its "Biennial Censuses of Manufactures." Although no detailed statistics are available, value of production is as follows:

Year	Dollar Value in Millions
1929	10.4
1931	5.6
1933	3.5
1935	8.1
1937	18.2
1939	16.6

Compilation of data since the beginning of the war has been suspended but trade estimates indicate that the value of 1947 production was approximately \$50,000,000.



Madruge & Smith is operating a Universal 2930 Junior Pacemaker crushing plant near Gridley, Calif., making a fine quality road gravel from the tailings of a dredging operation. The plant has an 18- x 24-in. roller bearing crusher with apron feeder, 24-in. TwinDual rolls, a 3- x 8-ft., 2½-deck gyrating screen, and is powered by a diesel motor. Gravel is dosed to the apron feeder from large gravel banks. Plant capacity is 60-70 t.p.h. of ¾-in. gravel with 70 percent crushing

LARGEST COMMERCIAL BLAST USES 1,362,985 LBS. OF "NITRAMON"*

Produces estimated 1,800,000 cu. yds. of rock fill
for T.V.A.'s South Holston, Tennessee, Dam



BEFORE

5,254 lineal feet of coyote tunnel were driven into the base of a huge hill of stratified sandstone. Three main adits with a total of 44 cross-cuts were required. Charge was divided into 190 units totaling 55,452 cans of "Nitramon" and 436 "Nitramon" primers, connected by about 4 miles of Primacord. Loading was accomplished in 17 working days.

Photo at right, taken just after the blasting switch was thrown, shows the whole burden of this record blast at the height of its lift. Note that the trees in the background are hidden by the crumbling hill.

DURING



AFTER

Nearly two million cubic yards of well broken rock, ready for the shovels.

This is the fifth, and largest, of a series of six coyote tunnel blasts made with "Nitramon" in the same general locality.

1. September 11, 1947.....	316,486 pounds
2. November 8, 1947.....	526,925 pounds
3. March 11, 1948.....	422,563 pounds
4. July 14, 1948.....	844,503 pounds
5. February 5, 1949.....	1,362,985 pounds
6. April 16, 1949.....	501,112 pounds
	<hr/> 3,974,574 pounds

For safety, efficiency, and economy in your quarry operations, look into the use of Du Pont "Nitramon." Ask your Du Pont Explosives Representative for full information. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT "NITRAMON"

A Product of Du Pont Explosives Research

* Reg. trade mark for Du Pont nitrocarbonitrile blasting agent.

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

ROTARY LIME KILN CAPACITY

A Reconciliation of Points of View

Approaching the question of what constitutes excellence of rotary kiln operation from divergent points of view, two authorities are found to be basically in agreement

By DR. C. R. ATHERTON*

THE QUESTION of maximum and optimum rotary lime kiln capacity is one which has been much discussed but little settled if the surface facts only are taken into account. In *Chemical and Metallurgical Engineering*, April, 1946, Ralph Gibbs, quoting from an earlier article, (ROCK PRODUCTS, November, 1942) presents the relationship

$$Q_d = K D^2 L / 100$$

where Q_d = optimum daily production in tons.

D = kiln shell diameter in ft.

L = kiln shell length in ft.

K = the production coefficient.

Mr. Gibbs goes on to say that "the value of the production coefficient K has been observed to be 1.5 with very good kiln operating practice." It should also be noted that he states that the value of K is dependent upon "the kind of material being processed and other circumstances attending the kiln operation."

In ROCK PRODUCTS, July, 1946, Victor Azbe says, in part, "formulas were developed from dimensions which supposedly should have given the expected kiln capacity, but none of them are of any value," Mr. Azbe then goes on to say that "simply expressed, whether the kiln is large or small, as long as it is not of some freak size it should produce one ton of high calcium lime for 35 cu. ft. of kiln space measured within the lining."

A table of performance rates developed in the same article shows the following:

Cu. Ft./Ton	Performance Rating
30-40	Very Good
40-50	Good
50-60	Fair
60-70	Poor
70-and over	Very poor

Here then we have the statements of two consultants whose opinions carry weight in the lime industry. Which shall we accept as authoritative?

Using the notation provided in the formula used by Ralph Gibbs with the addition of

d = net diameter of kiln inside lining

N = number of cubic feet required per ton of daily production
we find that the Azbe statement may be translated into the formula

$$Q_d = \frac{\pi d^2 L}{4N} = \frac{.785 d^2 L}{N}$$

Now, assuming a 6-in. refractory lining in the kiln, a reasonable assumption in the light of existing practice, we may set $d = D - 1$ and obtain

$$Q_d = \frac{.785 (D-1)^2 L}{N}$$

Let us now examine the two statements using the Gibbs "K factor" as 1.5 for very good production as being satisfactory. Equating the established formulas we find that

$$\frac{.785 (D-1)^2 L}{N} = \frac{1.5 D^2 L}{100}$$

and, solving for N , we obtain

$$N = 52.3 - \frac{104.6}{D} + \frac{52.3}{D^2}$$

Using $D = 7, 8$, and 9 as being representative of the most common kiln shell diameters we find corresponding values for N of 38.5, 40.0, and 41.3 cu. ft. It is thus evident that the "K coefficient" of Mr. Gibbs and the "volume factor" used by Mr. Azbe are essentially the same, the former allowing for some slight non linear variation not covered by the latter. It should be noted that the value of $K = 1.5$ places the unit production volume close to 40 which is the boundary line between "good" and "very good" production by Mr. Azbe's standards.

In the absence of a sliding scale of K values in the article presented by Mr. Gibbs we are in a position to develop such a scale by accepting as cor-

rect the net volume table established by Mr. Azbe. While close correlation at the "very good" level is not final evidence of reliability of either of the formulas, this correlation combined with the background and experience of the two men may be accepted as authoritative.

Again equating the two formulas

$$\frac{.785 (D-1)^2 L}{N} = \frac{K D^2 L}{100}$$

and solving for K in terms of N and D we obtain

$$\frac{1}{N} \left(78.5 - \frac{157.0}{D} + \frac{78.5}{D^2} \right) = K$$

from which may be developed the following table of K values:

N	7 ft. dia.					8 ft. dia.					9 ft. dia.				
	30	40	50	60	70	30	40	50	60	70	30	40	50	60	70
K	1.92	1.44	1.15	.96	.83	2.09	1.59	1.29	1.09	.97	2.07	1.55	1.24	1.03	.89

On the basis of these results and in view of facts noted above it seems entirely reasonable to say that Mr. Azbe and Mr. Gibbs are in agreement on what constitutes good production from rotary kilns and that the K factors listed below will show close agreement in the scale of performance following when used in the formulas

AZBE		GIBBS	
$Q_d = \frac{\pi d^2 L}{4N}$		$Q_d = \frac{K D^2 L}{100}$	
Very good	$N = 30-40$	$K = 2.00-1.50$	
Good	40-50	1.50-1.20	
Fair	50-60	1.20-1.00	
Poor	60-70	1.00-.86	
Very poor	70 or less	.86 or less	

Normal Kiln Operations

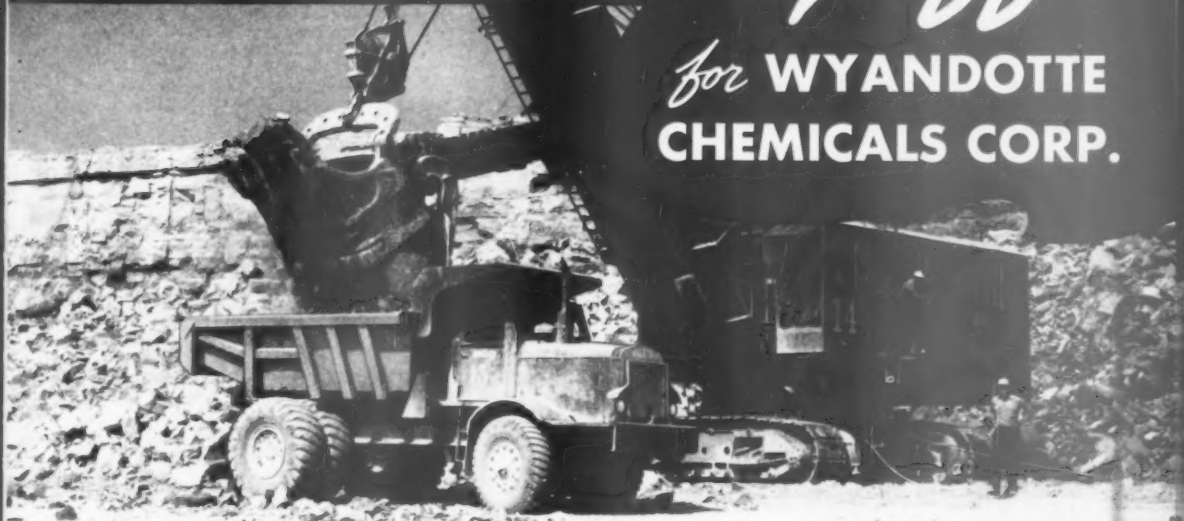
It should be noted that Mr. Azbe, in the above cited article, mentioned that he knew of no normal kilns operating at $N = 35$ ($K = 1.71$) but that he did know of kilns at $N = 37$ ($K = 1.62$). In view of this statement it seems that the upper range of production in the "very good" classification may be considered as marking the level of theoretical rather than practical excellence.

(Continued on page 135)

*Chief Engineer, L.I.M.E., Hershey, Penn.
†Italics are the authors.

"EUCS" Pay Off

for WYANDOTTE
CHEMICALS CORP.



At Alpena, Mich., Wyandotte Chemicals Corporation operates one of the world's largest limestone quarries — another job where "Eucs" are paying off by doing more work at less operating and maintenance cost.

Thirteen Rear-Dump Euclids of 22-Ton capacity replaced an electric haulage system for moving the rock from quarry to plant. Operating two shifts per day and six days per week, the "Eucs" haul approximately 800 tons per hour. The round trip averages 1¾ miles, with a maximum grade of 4 per cent. The "Eucs" are loaded with stone by shovels of 5 and 6 yd. capacity, and are used for removing overburden during winter months.

Wyandotte standardized on Rear-Dump Euclids because of their proved dependability and efficiency in mine and quarry operations. Their large capacity and fast travel speeds have increased production and lowered hauling costs at Alpena.

Euclid equipment has proved profitable for hundreds of owners on a wide range of off-the-road work. Your Euclid Distributor or Representative will be glad to discuss your requirements and show you how Euclids can do a better job for you.

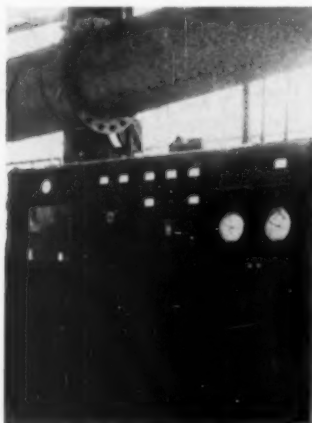
The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio



Instrumentation

(Continued from page 99)

(hood and back end), the pulverizer differential which is a measure of fuel level, air flow through the pulverizer and the temperature of the fuel-air stream as it leaves the pulverizer.



Controlled panel for kiln firing control

Hood draft is considered preferable to back end draft measurement as an indicator of kiln performance, in the event that blockages occur in the kiln. It is maintained at a reading of minus .05 in., which would correspond to a back end reading of $2\frac{1}{2}$ in. of water. Draft is automatically controlled through Bailey pneumatic drives on the louvre damper. For example, an increase in hood draft decreases loading pressure and closes the louvre damper down within a range of minus .5 in. to plus .5 in. of water. Back end draft is similarly varied. A Rayotube focussed on the clinker just inside the kiln hood is used by the burner purely as an indicator of change in the firing temperature, which is maintained at approximately 2800 deg. F. when producing type I cement, 2900 deg. F. for high early strength cement and 2700 deg. F. for type II cement.

Oxygen Recorder

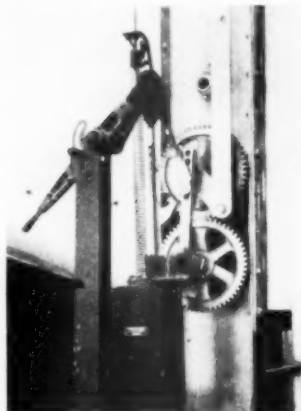
The Bailey oxygen analyzer is a device for the measurement of excess air within close limits and this installation is being hooked up for automatic readjustment of the fuel-air ratio to maintain the O_2 measurement at an optimum low value for most efficient fuel utilization. The device is claimed to be responsive to changes of 0.1 percent throughout its scale of measurement and its advantage, either as an indicating instrument or for automatic regulation, is that changes involving fuel and air flow are evident to the burner quickly.

This particular analyzer is described as utilizing the catalytic com-

bustion method. The gas sample is combined with a standardized fuel in a chamber in the presence of a heated catalytic filament which causes combustion. The heated filament is one leg of an alternating current Wheatstone bridge which, through variation in the resistance of the filament due to the heat of combustion, measures the volumetric percentage of O_2 in the gas. The temperature of the burning mixture varies proportionately to the amount of O_2 and causes an unbalanced voltage to be produced by the Wheatstone bridge in proportion to the volume of O_2 present. A gas pump draws off gas from the rear end of the kiln, washes it and forces it into the analyzer.

Electrical

The plant is operated on 25-cycle electricity and future plans call for a changeover to 60-cycle current. Accordingly, transformers were installed to enable all motor drives in connection with the program described to be operated from 60-cycle electrical power.



Louvre damper control

Non-Metallic Minerals in Illinois

THE AMOUNT of silica sand sold or used by producers in Illinois in 1947 was 2,533,800 tons, valued at the plants at \$4,351,200, according to Report of Investigations—No. 140, "Illinois Mineral Industry in 1947," compiled by the State Geological Survey Division. This was an increase of 12.3 percent in amount and 27.7 percent in value.

Sand (other than silica sand) and gravel, sold or used by producers in Illinois in 1947, amounted to 12,972,400 tons, and was valued at the plants at \$8,028,700. This was a decrease of 14 percent in value from 1946.

"Other sand" amounted to 4,536,900 tons and was valued at the plants at \$3,110,800, a decrease of 6.1 percent from 1946. Railroad ballast sand showed the largest increase in ton-

nage, 81,300 tons, or 49.8 percent, with an increase in value of 80.1 percent.

Increases in both amount and value were shown for natural-bonded molding sand, structural sands, and sand used in paving and construction. Sand for all other uses showed decreases in amount and value from 1946, except engine sand which declined 11.5 percent in amount but increased 16.1 percent in value over the previous year.

Gravel

Gravel comprised 70 percent of the total quantity of sand and gravel sold or used by producers in Illinois in 1947. It amounted to 8,435,500 tons and was valued at the pits at \$4,918,000, showing a decrease of 17.8 percent in amount and 15.3 percent in value from the previous year. Construction gravel increased more than 300 percent in amount and value over 1946, and railroad-ballast sand increased 11.7 percent in amount and 19.9 percent in value. Gravel for all other uses showed decreases from the previous year in both amount and value.

Total sand (including silica sand) and gravel amounted to 15,506,200 tons, valued at \$12,380,000, a decrease of 10.6 percent in amount and an increase of 2.6 percent in value over 1946. This exceeds in value the former high record established in the previous year when sand and gravel sold or used by producers in Illinois was valued at \$12,068,900.


During 1947 the quantity of ground silica or silica flour sold or used by producers in Illinois amounted to 189,250 tons and was valued at the plants at \$1,457,600. This was an increase of 37.1 percent in amount and 45.4 percent in value.

The amount of tripoli ("amorphous" silica) sold or used by producers in Illinois in 1947 totaled 14,700 tons, valued at the plants at \$314,100. This is a decrease of 6 percent in amount and 2.3 percent in value from the previous year.

Fluorspar

Illinois in 1947 was again the largest producer of fluorspar with production amounting to 51 percent of the national total. This was a percentage drop from 56 in 1946 although the production was considerably greater. Shipments from mines increased from 154,525 tons in 1946 to 167,157 in 1947.

The total dollar value of fluorspar produced in Illinois increased from \$5,493,642 in 1946 to \$6,148,654 in 1947. The average price per ton increased from \$35.55 in 1946 to \$36.78 in 1947. This may be compared with the national average of \$32.52 per ton in 1946 and \$33.25 in 1947. Steel was again the largest consumer of Illinois fluorspar; 72,389 tons or 43.6 percent of the total went into steel production in Illinois.



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Charles Scott, superintendent, left; Leonard H. Strauss, general manager, center, and A. W. Christensen, office manager, Thompson Crushed Rock Co., Kansas City, Kan.

Flexibility

(Continued from page 108)

Riprap stone is sized over a 5- x 14-ft. single-deck Simplicity riprap screen set at ground level adjacent to the primary crusher and with its center line perpendicular to the 30-in. belt conveyor carrying stone from the primary crusher to the scalping screen. Thus, mine-run stone may be dumped directly from trucks above into a hopper feeding the screen, and fines from the riprap screen are diverted on to the main belt feeding the plant, for sizing into commercial products. Riprap is stockpiled over a 42-in. belt conveyor, 90-ft. centers, that has an incline of 16 deg.

The screen has a deck of 1 1/4-in. thick manganese steel and carries 5-in. square openings for half its length followed by 14-in. square openings. It is driven by a 25-hp. motor and has a pressure lubricating system for its bearings. Minus 5-in. stone is chuted to the belt feeding the commercial stone plant, stone passing over the 5-in. screen openings but passing through the 14-in. openings (riprap) is stockpiled and the occasional overs are diverted through a chute at the end of the screen on to the ground. These large pieces can, of course, be accumulated and then be loaded in trucks to be fed into the primary crusher.

The stockpiling conveyor must withstand unusual service and is of Hewitt-Robins manufacture. Its inclination is limited by the tendency for roll-backs and 16 deg. is the maximum safe angle. It carries high skirt-boards and has rubber-cushioned idlers from three to eight inches apart at the point of loading to resist shock. Suspended arms of heavy rail are the means of slowing the speed of stone as fed over the screen. Production of riprap is 600 to 700 tons in 8 hr., requiring the screening of 1000 tons of mine-run stone.

Personnel

Milton Feld is president of Thompson Crushed Rock Co., which he pur-

chased in 1942. Active management of the business and its various operations is headed by Leonard H. Strauss, general manager, who entered the crushed stone business after his discharge from the army as an air forces captain. Mr. Strauss is a graduate engineer. Charles Scott and A. W. Christensen, both war veterans, are plant superintendent and office manager, respectively. Under the aggressive guidance of these ex-army men, the company has progressed rapidly and there are plans in the making now for further diversification particularly toward the production of fine stone products and the development of markets for them.

The plant described was designed by Messrs. H. B. Thompson, Leonard Strauss, and R. F. Feind of Allis-Chalmers Manufacturing Co.

Limitation on Axle and Wheel Loads

NATIONAL READY MIXED CONCRETE ASSOCIATION, in Executive Letter No. 463 to the industry, presents a review of the talk given by Thomas H. MacDonald, Commissioner of Public Roads, at the 46th annual meeting of the American Road Builders Associa-

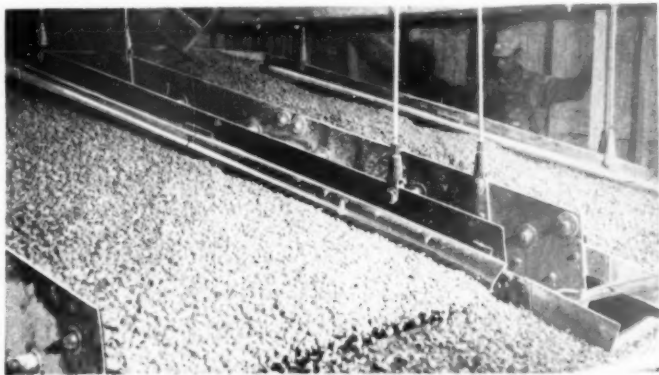
tion, covering observations in support of the limitation on axle and wheel loads recommended by the American Association of State Highway Officials. He said:

"Axle loads in excess of 18,000 lb. should not be authorized, and any revision of laws governing gross weight of vehicles should take the form recommended by the American Association of State Highway Officials, which relates gross weight to the number and spacing of axles. This code is the product of many years of research, of field tests, of numerous conferences, and of experience. It has generally the support of state highway and motor vehicle officials, of automotive manufacturers and of user organizations. The essentials have been written into the laws of a majority of the states. This code provides limits on sizes and weights of motor vehicles which should be rigidly enforced to serve the public's interests."

Mr. MacDonald expressed his belief that a considerable part of the bad condition of present highways is due to the failure to comply with the A.A.S.H.O. standard, and since federal-aid highway funds now are employed to some extent in the construction of city streets which form a part of the interstate highway system, this is especially important.

He continued: "The volume of truck traffic is nearly three times what it was in 1931, when I stated that roads are more destroyed really by climatic and soil conditions than they are by any use that is made of them. Even more significant is the proportion of trucks that carry heavy loads. In 1931 trucks traveled 11.4 billion miles on main roads. This year the figure may well reach 34 billion. In 1931 only about eight trucks in every thousand had axle loads of 18,000 lb. or more; 33 had axle loads of 20,000 lb. or more, and 14 were 22,000 lb. or more. Axle loads of 28,900 lb. have been found in Connecticut, 29,000 lb. in Massachusetts, 26,000 lb. in Ohio, 40,420 lb. in New Jersey, 31,820 lb. in New York,

(Continued on page 132)



Two double-deck vibrating screens operating in parallel.



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Conveyors stand up longer . . .
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be sure it will carry the load. It will withstand extreme gouging, tearing and abrasion. And it will resist moisture and mildew!

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Load Limitation

(Continued from page 103)

and 26,200 lb. in Maryland.

"A main highway of average traffic characteristics which in 1931 carried 5000 vehicles per day, including 780 trucks, in 1947 had a traffic of 9500 vehicles per day, including 1980 trucks. Daily the highway in 1947 was subjected to 137 axle loads of 18,000 lb. or more, 65 of which were 20,000 lb. or more, and 27 were 22,000 lb. or more.

"During the early thirties a gradual increase in damage to pavements was observed. Prior to the war, damage had reached alarming proportions. With the marked increase in heavy loads since the end of the war, the damage has become even more alarming, occurring on all types of high-type pavements. Concrete pavements are subjected to pumping at joints, followed by rapid deterioration of the whole surface. Whenever pumping occurs the soil is ejected from beneath the pavement. Soon that portion of the pavement is without subgrade support, and a heavy wheel load breaks it off from the rest of the slab.

"There is conclusive evidence that this damage is caused by heavy wheel loads. Pumping was known, but was of little consequence during the twenties. Characteristically it occurred on clayey soils known to be inferior as road support. Now occurrence is widespread and includes pavements on sand soils regarded as excellent road support. This matter has been the subject of serious study by practically every highway research agency, and they all reach the same conclusion—the damage occurs only on pavements subjected to frequent heavy wheel loads and particularly overloads.

"A pavement designed to carry axle loads of 18,000 lb. should be able to carry large numbers of such loads, but should not be subjected to heavier loads. Pavements intended to meet this requirement did so during the twenties, but began to suffer severe damage with increase in frequency of heavy overloads during the thirties. New highways are planned to last for a considerable period of years. The starting point in their design is the determination of the loads that will be legally imposed during that period. Load limits must be carefully fixed and rigidly adhered to."

**New Crushing Equipment
Doubles Plant Capacity**

ASH GROVE LIME AND PORTLAND CEMENT Co., Galloway, Mo., has started operation of its new \$160,000 crushing and screening installation. The new equipment more than doubles previous handling of rock, according to Carl L. Morris, production manager.

Leases Quarry

FREY COAL & STONE Co., Mercersburg, Penn., has leased the Prutzman Stone Quarry at Morysville, Penn.

Durability

(Continued from page 103)

out 20 t.p.h. of chipped ice. Three York vertical compressors driven by General Electric motors are in the ice plant.

The aggregate is pre-cooled by the addition of from 150 to 300 lb. of chipped ice and the concrete as poured is kept at 80 deg. F. or under when possible and with a top temperature of 118 to 120 deg. F. The ice is used only in hot weather.

The addition of pozzolan to the concrete makes it slightly stickier but its over-all workability is improved. Darex was tried along with the pozzolan and this air entrainment agent worked very well and improved the placeability of the concrete; however, the engineers felt that this additive was more to correct possible damage from freezing and thawing, conditions which are totally lacking in the area, so its use was discontinued.

The Davis dam project is another step towards the control of the Colorado river and this huge development program is under the direction of the Bureau of Reclamation, United States Department of the Interior. The project will produce urgently needed electric power and re-regulate the irregular flow of water from Boulder dam above for the benefit of the irrigated areas below. It also fulfills certain provisions of the Mexican Treaty relating to water diversions in the rivers of the southwest. It is a self-liquidating project, from a financial standpoint.

The dam involves the placement of almost 4,000,000 cu. yd. of earth and rock fill and some 565,000 cu. yd. of concrete. The rock-fill embankment will rise 138 ft. above the river bed and the dam will have a crest length of 1600 ft. with a 50-ft., 2-lane highway being a part of the structure. There will be installed for power development five 45,000 k.v.a. semi-out-door type of generators. It is estimated that the power output will be about a billion kilowatt-hours per year.


The Utah Construction Co., prime contractor, has a large camp on the Nevada side of the river and the Bureau of Reclamation headquarters are on the Arizona side. Peak employment of men is in the 1500 range.

Personnel

The Davis dam project is headed by Bureau of Reclamation Commissioner Michael W. Straus in Washington, D. C.; L. N. McClellan is chief engineer with headquarters in Denver; E. A. Moritz is regional director with headquarters in Boulder City, Nev.; H. F. Bahmeier is construction engineer and in immediate charge of the work for the Bureau of Reclamation. He is assisted by J. R. Walatin, field engineer, and H. R. Orr, office engineer. R. G. Manning is progress engineer. Bert C. Wickas is chief laboratory technician and Ernest W. Burke is

30,000 TONS in 435 HOURS

AT HARLAN COUNTY DAM'S FINE AGGREGATES PLANT



It's an EAGLE
"Swintek"
at Harlan

←

It's an EAGLE
Classifier
at Harlan

↓

ON-THE-JOB production of sand and gravel helps whip your rising freight and other costs. More & Alsop's Eagle-equipped Harlan County Dam's Fine aggregates Plant produced

30,000 tons of salable material in 435 hours of operation to meet the specifications of the Bureau of Reclamation. Here's how the Eagle "Swintek" Dredging Ladder and Eagle Screw Classifier teamed up at this Kansas plant to meet the original specifications:

Grading	Spec. %	% Ret.	Grading	Spec. %	% Ret.
No. 4	0	.5	No. 50	20-30	27.7
No. 8	7-13	9.7	No. 100	12-22	13.2
No. 16	12-18	17.0	No. 200	3-7	3.0
No. 30	20-30	26.0	Pan	1-5	2.9

A 6" Dredge pump was used with the 50' Light Duty "Swintek" which loosens and agitates the deposit while keeping boulders and other material out of the suction line. The Eagle Screw Washer-Classifiers-Dehydrator features the new perforated flights for more complete dewatering. Write for catalog.

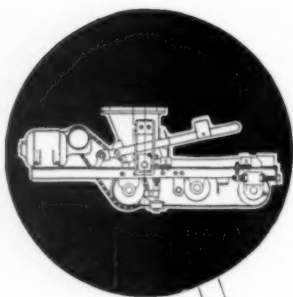


Sand and Gravel Equipment
"SWINTEK" Dredge Ladders-Screw Washers
Log Washers-Dehydrators-Sand Tanks
Classifiers

EAGLE IRON WORKS

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Des Moines, Iowa



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 Disc Feeders
 Volumetric Belt Feeders
 Constant-Weight Belt Feeders
 Weight-Indicating Belt Feeders
 Volumetric Non-Flooding Drum Feeders

Write for Bulletin 33-D-7

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chief concrete inspector. Bud Funderland is batching plant foreman.

The Davis Construction Co. which supplies the aggregates is owned by M. Davis with offices at the dam.

Calcination

(Continued from page 121)

the kiln due to low temperature also prevented some needed air from coming through the cooler for proper heat recovery.

Gas Recirculation

The Azbe system of recirculation is based on removing recirculation gases from the upper part of the calcining zone or lower part of the preheating zone where a normal kiln gas temperature of 900 deg. F. to 1000 deg. F. or more is experienced. The fan used to handle such gases should be of high temperature construction to handle these gases with mechanical safety. Taken from the kiln at this point, the gases may be fed back into the kiln at three points. The first point is through the upper part of the center burner through ports just above the gas ports. This stream creates turbulence and mixing of fuel gas and primary air where it is most needed. The second point of entrance is with the fuel gas itself. Here recirculated gases act as a diluting agent to give greater volume to the gas, hence some higher pressure behind the fuel gas ports and more uniform distribution over the kiln shaft. The third point of use, only with a gas producer, is as an endothermic agent with the producer blast stream. Here the CO₂ in the recirculated gases serves the same purpose as steam has previously. It has two advantages in that the temperature is higher than steam, and the CO₂ is available for the cost of fan operation which is certainly much less than for a steam-generating plant. Clinkering of the fuel bed is kept down by proper CO₂ concentration in the blast which in turn is a factor of the ash fusion temperature of the coal itself.

Storage Zones

A fourth zone of a kiln is sometimes added. This is the "storage" zone and is that part of the kiln above the point where exhaust gases are taken off. It has advantages and disadvantages that must be weighed in light of local conditions as much as is possible. With the storage zone, the kiln charging can be done during the day shift, providing enough stone to keep the active part of the kiln full over night. A minor disadvantage is that when the kiln is drawn, the top of the preheating zone is immediately filled with stone, cooling gases by several hundred degrees all at once and affecting kiln draft accordingly. Without the storage zone, the exhaust gas temperature can be controlled in a narrower range by adding a car of stone at a time at fairly reg-

ular intervals until the next draw, with resultant steadier kiln draft. However, a low kiln with no storage zone must have provisions for charging 24 hr. per day for proper operation.

Thus we have built up the kiln from a series of parts, each related to the other, a combination of which will give a uniformly well-burned lime with maximum practical fuel efficiency and minimum labor requirements per ton of lime. Proper zone heights combined with correctly designed entrance points for fuel, primary air, and recirculated gases, and the use of properly sized stone, all make up the picture of the modern vertical kiln with capacities of one ton of lime or more per square foot of hot zone shaft area per day, and fuel consumption of 5,000,000 B.t.u. or less per ton of lime produced.

Lime

(Continued from page 126)

Conclusion

There is basic agreement on the question of what constitutes excellence of operation of rotary kilns insofar as daily production is concerned. Approaching the problem from a different angle Mr. Azbe and Mr. Gibbs reach the same conclusion; that efficient operation of a rotary kiln having dimensions within what may be considered as normal limits will produce approximately one ton of high calcium lime for every 40 cu. ft. of net volume.

It should be noted that the formulas developed in this article give no consideration to problems of thermal efficiency of the kilns in question. On the surface it seems that such questions should be considered when this problem is being discussed.

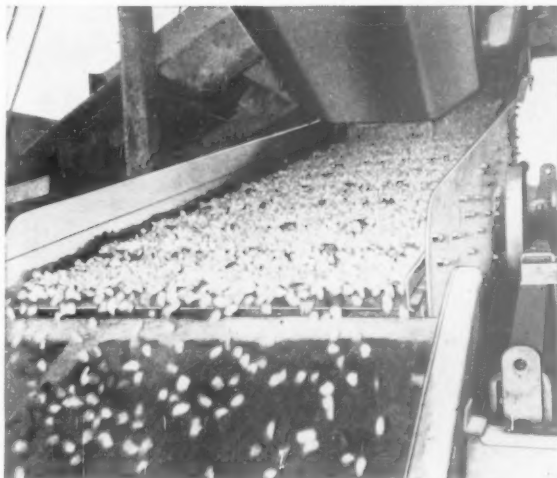
Changes Name

CRETEN STONE PRODUCTS, INC., Turner, Kan., has announced reorganization and change of its name to Peerless Quarries, Inc. Officers and operating personnel of Peerless are: S. H. Reno, president; G. M. Reno, secretary; Harry Hamilton, vice president; G. D. West, treasurer; Charles J. Madden, comptroller and assistant to management; Merten M. Petty, sales manager, and W. N. Masters, accountant and office manager. The firm produces agricultural limestone and crushed rock.

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LEHIGH PORTLAND CEMENT CO., LOUISVILLE CEMENT CO., CERTAIN-TEED PRODUCTS CORP., FEDERAL CRUSHED STONE CORP. and NATIONAL GYPSUM CO. were top honor winners in the Buffalo, N. Y., area in the annual accident prevention contest sponsored by Associated Industries of New York State.

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Accurate Sizing**
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This SECO vibrating screen now in 11th year of service for B. V. Hedrick Gravel and Sand Co., Lilesville, N. C.

Here's another example of how Seco vibrating screens are making screening more profitable for operators. The positively controlled, true circular action of a Seco is your assurance of accurate sizing, high tonnages and low maintenance.

The Seco pictured here is mounted high up in the air, yet it operates so smoothly that no vibration is transmitted to the supporting framework. No matter what screening you have to do—coarse gravel, stone, sand or ag-lime, a Seco will do efficiently and economically and will serve you faithfully for many years.

Send your screening requirements to Seco or write Dept. M for New Catalog No. 203.



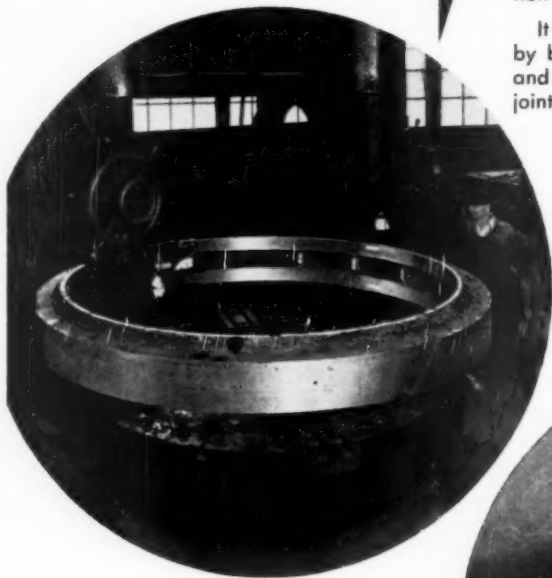
SCREEN EQUIPMENT CO., INC.

BUFFALO 21, NEW YORK

In Canada, United Steel Corp. Ltd., Toronto, Ont.

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Stroh Diagonally Cored Split Tires — splits welded in the field — are now in successful service on Driers, Kilns and Coolers in many plants throughout the country.



The illustration shows a Stroh Diagonally Cored Split Tire, installed on an eight foot Drier. Time of installation, including reaming of holes and riveting of seventy-two rivets: thirty-six hours.



Diagonally Cored SPLIT TIRES Two Segment Type Splits Welded in the Field

This tire can be quickly and easily installed with a minimum of down-time, without tearing out a section or disturbing the existing alignment of a shell.

It has no finished mating surfaces held together by bolts to loosen up under the action of the load and heat. Any radial section through the welded joint has a very large percentage of parent metal to withstand the stresses to which it is subjected.

After welding the tire is round — the weld metal laid into the diagonal split does not "hump up," the welded joint rolls smoothly over the trunnion roller.

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Sales Engineering Department



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One of the many tests Quaker Conveyor Belts must go through is shown above. A blowtorch, at high heat, held six inches from the surface of the belt for six minutes. Quaker Belts take it and are ready for more. They're tough, rugged and built for longer wear. They're made for the rock products industry to assure less maintenance . . . to save you loss of labor . . . to help reduce the "break-even point" in your plant operations.

Whatever your need for industrial rubber products there's a Quaker Pre-tested Product to meet it. Power transmission belting for every type of installation . . . rod and sheet packings . . . moulded and braided hose . . . and all kinds of custom-made moulded rubber products. To economize on production costs . . . it pays to Quakerize your plant.

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Quaker hose, in moulded and wrapped construction, is ruggedly built of pre-tested materials for trouble-free transmission of air, steam, water, acids, volatiles.

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Labor Relations Trends

(Continued from page 81)

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Lime Convention

(Continued from page 117)

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Plowing, he said, is not the simple answer because by so doing the good soil is diluted with raw or toxic subsoil. Deep rooting is needed to get water and he said that calcium and the pH are the two most important factors in extending the root range.

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to see



Special Alloy
Moly Cop
Ball

Regular
Carbon Steel
Ball



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in Structure and Hardness

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MOLY-COP

COPPER-MOLYBDENUM-ALLOY

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In mills, this important difference shows up in longer wear, retention of shape and minimum spawling. Sheffield Moly-Cop balls grind more tons of ore more efficiently.

Mills around the world have proven, to their own satisfaction, that Moly-Cop's superiority adds up to substantial cuts in grinding costs.

Carbon and Alloy Steel, Ingots, Blooms,
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Bars, Steel Joists, Structural
Shapes, Road Guard,
Reinforcing Bars

Welded Wire Mesh, Wire Products, Wire
Rods, Fence, Spring Wire, Nails,
Rivets, Grinding Media, For-
gings, Track Spikes, Bolt
and Nut Products

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All other Countries: **ARMCO INTERNATIONAL CORPORATION** Middletown, Ohio

The materials tested were applied in equivalent amounts according to neutralizing value, to an acid soil of 4 pH.



Bernard E. Gray, General Manager of the
Asphalt Institute

Dr Merkle discussed the soil acidity theory and said that the intake of iron by plants is influenced by the degree of soil acidity. He has studied the structures of plants grown in various soils. Some are definite aluminum collectors and others such as the blueberry are manganese collectors. The uptake of iron is good in the presence of lime. He believes that deep application of lime will minimize manganese taken up which is important in raising corn as it does not thrive with high manganese to iron ratio. Pennsylvania has six million acres of cropland and four million of pastureland and should use one-third ton of liming materials per acre, or 3.3 million tons (twice the present annual use) annually purely for a maintenance job. The requirement would be 4 to 5 million tons per year for five years to bring the soil into balance and then 3.3 million tons to maintain the balance. If the concept of deeper application would be adopted, the annual need would be much greater.

Lime-Cement Mortars

"Experiences and Experiments with Lime Cement Mortar" was the subject of a paper by John C. Thornton, Architect, The Detroit Edison Co., Detroit, Mich. Mr. Thornton did not care to be quoted so we comment but briefly on a presentation that was very favorable to lime. Mr. Thornton's comments were based on experiences with leaky walls in substations and studies of materials and methods to correct the bad experiences. A 24-hr. soaking period before use is practice with hydrated magnesium lime for best results. Efflorescence was observed to decrease with higher lime content in mortars, according to tests with 1:2:8, 1:2:9, and 1:3:12 mortars. Mr. Thornton's experience has been that 1:2:7 or 1:2:8 mortar can develop higher

strength than the code calls for with a 1:1:6 mortar, and we assume he meant by use of a dolomitic finishing lime after a 24-hr. soaking period with loose sand of 28- to 100-mesh size.

When pressure hydrates came on the market, they were tried and excellent results obtained. He does not use patented mortars and believes that no waterproofing is required when a properly mixed lime-cement mortar is used.

Lime in Paving

Bernard E. Gray, general manager, The Asphalt Institute, New York, N. Y., in a paper, "Lime, An Important Material in Paving," said that lime



Enjoying the climate are Mr. and Mrs. W. J. Barrett, New England Lime Co.

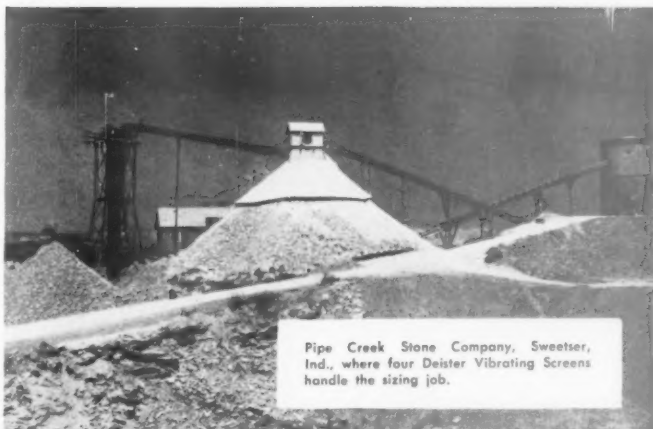
is becoming more important in paving, for subgrade treatment to permit cheaper and thinner surfaces, and as an additive to make relatively inferior but more available aggregates usable in asphalt mixes.

Lime's function in asphalt mixes is to make the aggregate surfaces favorable for the retention of asphalt and to enable a thicker film of asphalt to adhere to the aggregate. Mr. Gray pointed out that good gravel pits are being depleted and that as a result best use must be made of deposits readily available to a construction site. The problem is acidic aggregates and that is where lime comes in as a coating favorable to bond.

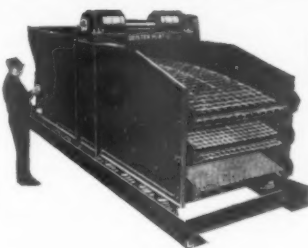
Utilization of Resources

Melvin H. Baker, president, National Gypsum Co., Buffalo, N. Y., made some very significant remarks and gave some warnings to the industry for the years ahead in an excellent talk entitled "The Utilization of Natural Resources."

Mr. Baker pointed out that lime is one of the five basic materials for the chemical and metallurgical industries, that its importance was proven as vital during the war, and he itemized a list of important commodities and applications for which lime is absolutely essential. Yet, he said that the lime industry is just awakening to the po-



Pipe Creek Stone Company, Sweetser, Ind., where four Deister Vibrating Screens handle the sizing job.



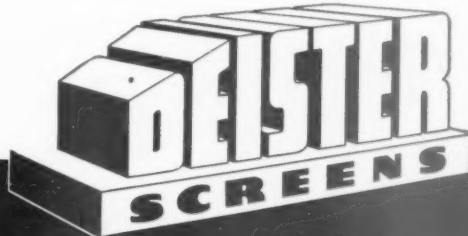
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tentialities of its products. He believes that lime has just begun to assume its rightful place.

While limestone deposits are extensive, Mr. Baker said that really high-grade deposits are very limited and must be conserved. One of the reasons is stiffening requirements as some industry users find it important that exceedingly low percentages of iron, phosphorus, arsenic or fluorine, etc., be a requirement in the product they buy. Proven high-grade limestone deposits do not exceed 50 to 60 years' supply, according to Mr. Baker, who believes they are in the category of scarce resources, sufficiently so that the industry must take it upon itself to conserve them.

Mr. Baker complimented the association on its convention and for its expanding research efforts which will broaden markets. Only a profitable industry is in a position so that it can do research and expand markets, he emphasized.

Mr. Baker, in anticipation of competitive merchandising, called atten-



Admiral William F. Halsey snapped informally at one of the luncheons

tion to the "ill-considered marketing practices" before the war when many of the weaker companies were eliminated, during years when plants operated at some 60 percent of capacity. He hopes that that will not happen again and believes that expansion of markets, and services, higher quality of product and lowered costs are the answers to sound business in the years ahead.

The industry, he said, can only justify its existence if it can do a better job from the standpoint of costs than its customer could do. He believes the industry must prepare itself to do a better selling job than it has and must train sales personnel properly. He is opposed to sales through brokers because of devious sales methods, rebates and other devices which are frequently used when outsiders sell a product. Carefully planned sales programs, efficient production and wise sales management directed toward creative selling are desired. With a good product and

service, price is a secondary point in creative selling, he pointed out.

In commenting on capacity for the production of lime, Mr. Baker said that outmoded methods of distribution contributed to great capacities in the past. Greater markets than in the 1930's will be required in the years ahead to utilize the productive capacity of the industry.

He believes that market research is the answer and suggested that the manufacture of metallic magnesium might even be made commercially feasible if some of the money wasted in competitive feuding be utilized for the purpose of developing the process. In conclusion, he urged that the industry strive constantly to develop new markets and improve its products. Research in sales and directed to product improvement was strongly advocated. He believes that fundamental research must continue, that costs must be held down and that high grade deposits of limestone must not only be conserved but extended.

Research Session

The research session, under the chairmanship of Prof. Walter C. Voss, Massachusetts Institute of Technology, heard three papers. Dr. Willem Rudolfs, who was scheduled to present a report on Sewage and Trade Wastes Research at Rutgers University, was not able to be present.

Prof. Voss, in his introductory remarks, made some significant comments on the value of research and its application in building and broadening markets. He started by saying that he was impressed with the vastness of lack of knowledge rather than what was already known. There is always the question as to whether fundamental research or applied research should come first but he said that they cannot be departmentalized. Nothing is ever done in research unless need for use has stimulated the desire for study. Much research revolves around setting up conclusions first and then trying to prove them out.

Prof. Voss was impressed with Mr. Baker's remarks on the duties of research and he gave emphasis to the need for the solution of economic and technical problems as part of the overall picture. According to Prof. Voss there are many misinterpretations of facts and poor application made of research by salesmen and management. This stems from lack of knowledge of the fundamental whys of research data. He hopes that the various researches now in progress will be integrated on the fundamental level.

Lime Stabilization Research

Dr. K. B. Woods, Professor of Highway Engineering, Purdue University, summarized the findings from many tests in his report on lime stabilization research at Purdue. Studies are being made of the use of lime in base

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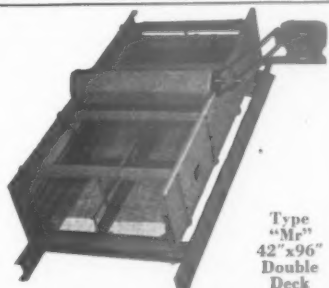
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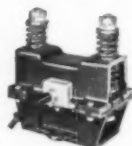
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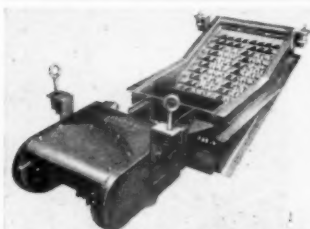
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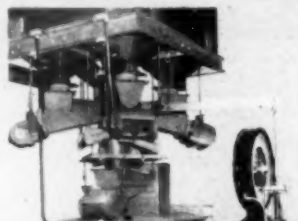
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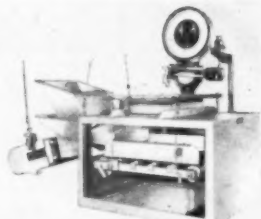
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courses and sub-bases and are being done with varying percentages of lime as applied to samples of many types received from various states east of the Mississippi river. Traffic conditions and the heavy loads on highways, he pointed out, will require much greater surface thicknesses or more effective stabilization of sub-grade soils. The application of lime to subgrade materials has shown amazing results with some soils.

Among the tests conducted have been plastic limit and liquid limit tests and compaction and penetration tests. Unconfined compression tests of fine-grained materials with and with-



President Melvin H. Baker of National Gypsum Co. in an informal pose

out lime application have been made and specimens tested to failure. Another series of tests was of coarse-grained clay gravels and synthetic soil-gravel mixtures. Fundamental research is required but these preliminary tests were conducted to determine whether or not a broad program of research would be justified.

A number of slides was shown, of sources of samples, grain size distribution and test results. Hydrated lime proved more effective than limestone dust. Most of the tests compared materials without lime and with two and five percent lime added. Penetration resistance, an important measure of strength, increased with the application of lime.

In the unconfined compression test series, lime showed up well particularly with fine-grained samples. In all cases, better test results were secured with five percent lime addition than with two percent. With certain soils, the addition of five percent lime resulted in greatly increased strengths. According to the California bearing ratio test, the addition of lime showed definite cementing properties. Just how effective the addition of 10 per-

cent lime would be has yet to be determined.

In conclusion, Dr. Woods said there was indication of substantial improvement of subgrades and subbase through the addition of small quantities of lime. Increased resistance to the detrimental effects of water has been demonstrated. There is a need for a series of durability tests to determine whether or not freezing and thawing will reduce the results from strength tests.

Fundamental Research Fellowship

Some very interesting results and conclusions have developed from work on the fundamental research fellowship at Massachusetts Institute of Technology during 1948, according to the report by James A. Murray, Associate Professor of Materials. Two men have been giving full time to the



Two research experts: James A. Murray, M.I.T., left, and C. J. Lewis, Warner Co.

experimental work on lime at the institute and most of the work thus far has been in correlation of lime burning conditions with the properties of lime.

Data submitted were of results obtained from burning pure optical grade, cleavable calcite which was selected as a reference material, with the view to investigating the effects of impurities later. The calcite is burned in a 1 1/4- x 36-in. electric muffle kiln and the size of feed was 10- to 20-mesh calcite, finely subdivided so that the burned product would not require grinding.

For the purpose of study, it was decided that the rate of slaking of quicklime was the most important property to evaluate, as a measure of activity of lime in water, and that the effect of time and temperature in burning in their relation to slaking rate be determined. A device was developed to measure the activity which is a function of temperature rise during slaking. Properties of slurries are also being studied.

A slide was shown of the kiln,

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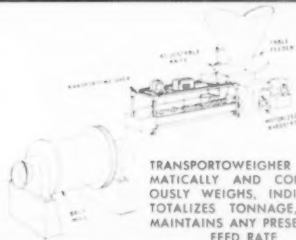
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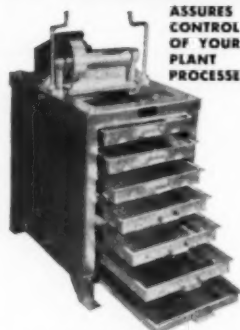
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which receives its feed from a spiral feeder under a hopper. The burned product discharges into a sealed container in order to keep air from the lime. A thermocouple at the feed end measures the temperature distribution. The circuit is purged with nitrogen to prevent recarbonation and rehydration and, later, CO₂ will be circulated to determine the effects of recarbonation.

Four temperatures of burning in the kiln, 2500, 2300, 2100 and 1900 deg. F., were the basis for the results reported and temperatures during slaking with seven parts distilled water were tabulated for the limes resulting from various firing conditions. For lime burned at 1900 deg. F. the maximum slaking temperature was reached in six seconds, the temperature was still rising after ten seconds for lime burned at 2100 deg. F., and the rate of temperature rise was very slow for lime burned at 2300 deg. F. and 2500 deg. F.

The temperature rise during slaking at five seconds was then selected as a measure of activity. The increase was 33 deg. for the lime burned at the lowest temperature and 22.8 deg. for the lime burned at 2100 deg. F., proving that the lime burned at 1900 deg. F. was much more active.

Time of retention in the kiln at given temperatures was also studied, for periods up to three hours, and little effect on the activity of the lime was observed. Over-burning of lime was proved to change the properties

of the product markedly. Mr. Murray suspects that impurities will reduce the temperature at which over-burning takes place. Surface area and porosity were higher for lime burned at the lowest temperature and porosity appears to be the controlling factor in activity.

Properties of slurries and hydrates are under study but results thus far are limited and therefore not conclusive. The limes burned at the two lower temperatures are slow settling while those burned at the higher temperatures are fast settling, but no difference in rate of reaction with acid was observed. One interesting observation is that hydration smooths out variations in the properties of quicklime.

The thermal analyzer developed by the researchers may be used to determine the time of carbonation for plasters and mortars.

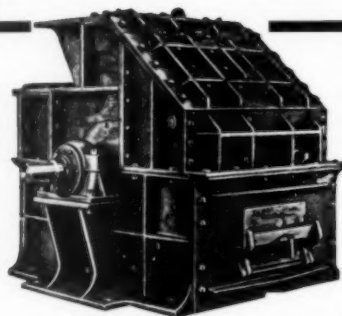
Waste Acid Treatment

A paper, "Some Practical Suggestions on Waste Acid Treatment," by C. J. Lewis, Technical Director, Warner Co., Devault, Penn., presented some very helpful approaches to the correlation of research data with sound merchandising. Mr. Lewis' paper is published in full in this issue with the exception of two graphs which were shown to illustrate what is meant by pH and to point out the great difference in acid concentrations at various pH's.

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Use of Lime in Trade Waste Field

(Continued from page 119)

begins to lose efficiency on the alkaline side. However, the waste pickle liquor may be near a source of dolomitic lime so that even with reduced efficiency the dolomitic material is still more economic.

Now, as can be seen from Fig. 5, there would be no need to carry pickle liquor treatment to a pH of 8.5 if the ferrous iron could be converted to the ferric form. This is often feasible since ferrous iron changes to ferric iron in the presence of oxygen and an alkaline agent. The alkaline agent is necessary to react with the acid liberated when iron changes to ferric iron. In other words, if lime or limestone is added to pickle liquor and the mass blown with air while being held within the pH range over which ferric iron precipitates, ferrous iron will change to ferric iron and precipitate, and the entire pickle liquor system can be freed of iron and mineral acid without ever passing the neutral point of pH 7. So long as time for the aeration and iron change is available this can be done even with pulverized limestone. Therefore, where the volume of pickle liquor is small so that it can be aerated and batch-treated, it is feasible to use either high calcium or dolomitic lime as well as pulverized limestone. The effluent from the calcium treatment will be saturated with gypsum and that from the use of magnesium limes or limestones will contain a high concentration of magnesium sulfate in solution. On the other hand, where the volume of pickle liquor is large, such as in strip pick-

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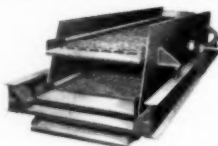


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ling, and the flow rate is rapid, it is reasonable to expect that a high calcium lime will be the most often preferred.

Sludge Disposal

While the two fundamentals of pH and time available for reaction are basic to the choice of a liming material for acid waste treatment, there are, of course, other factors. One very important factor involves the disposal of sludge. Sometimes the sludge problem is so acute, particularly where there is no cheap land area for lagooning, that the dewatering and disposal of sludge outweigh all other considerations. This is one of the reasons why acid waste treatment processes cannot be standardized but must be tailor-made to fit the occasion. The subject of sludge disposal, which cannot be touched upon at this time, should furnish subject matter for our future programs.

In conclusion, I would like to voice my opinion that it will take many years to consummate the present drive to clean up public waters. Stream pollution abatement bills have appeared in almost every session of Congress, and recognition of the seriousness of public water pollution is nothing new. The emphasis on and interest in the current pollution abatement drive do, however, seem to be greater than at any time in the past, and apparently continue to gain momentum. This may well be the beginning of the effort which will not be interrupted by politics, war or indifference. If such is the case, the lime industry may look forward to an expanding market for all forms of lime in the trade waste field. Such market expansion is not likely to be climaxed for at least 20 years, but the demand for lime in trade waste treatment may well take up the slack of reduced demand for lime in other markets over the next few years. From a long-range point of view, I believe there will be a net gain eventually requiring expanded lime production.

The lime producer can best protect the position of lime in the expanding trade waste field and properly speed up the expansion of the lime market in this direction by appraising his own

products along the lines I have indicated, and being ready to and capable of applying such basic information to acid waste problems.

The author wishes to express his appreciation to James A. Murray, formerly Director of Research of the Warner Co., for preparing the calculations and data used in developing the curves illustrated in Fig. 4.

Manufacturers' News

Vulcan Iron Works, Wilkes-Barre, Penn., announces the appointment of J. F. O'Brien as general sales manager, and C. A. Netter as general purchasing agent.

Barber-Greene Co., Aurora, Ill., announces that the McLean Co., Cleveland, Ohio, distributors for Barber-Greene equipment, recently opened a new office, service headquarters and warehouse at 3525 Lakeside Avenue.

International Paper Co., New York, N. Y., has appointed A. C. Clarke as district sales manager in Atlanta, Ga. C. A. Crain will continue to operate out of Atlanta, while W. D. Peters, also operating out of Atlanta, will join the sales staff in New York. J. A. Groden, formerly with the New York office, has been named district sales manager in Boston, Mass.

Radio Frequency Laboratories, Inc., Boonton, N. J., has promoted Everett Gilbert to the position of vice-president for engineering. He has been special projects engineer since 1945, and was formerly associated with the General Electric Co.

Baker Industrial Truck Div. of the Baker-Raulang Co., has moved its general offices including the purchasing, sales, engineering and service departments, to 1250 West 80th St., Cleveland, Ohio. The division's manufacturing operations will be moved to the same address in the near future.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that the company is discontinuing the adjustable threaded plate sheaves for V-belt drives in the larger sizes and recommends that Vari-Pitch sheaves be substituted. Adjustable sheaves to 6.125 in. in outside circumference are available.

LONGER PRODUCING LIFE BUILT INTO FARREL-BACON CRUSHERS

Permanent strength and operating efficiency is engineered into these crushers at every vital point. Farrel-Bacon will provide industrial units or completely designed and equipped plants, including screens, elevators and conveyors. Also other types of mine, quarry, sand and gravel plant machinery. Write for complete information.

FARREL-BACON
ANSONIA, CONNECTICUT



Truck Trailer Manufacturers Association, Washington, D. C., announces that a mid-year general meeting and luncheon for all trailer manufacturers and supplier associate members will be held July 22 at the Edgewater Beach Hotel, Chicago, Ill.

Bemis Bro. Bag Co., St. Louis, Mo., has announced the election of David M. Finley as assistant secretary. Formerly chief accountant, Mr. Finley has been with the accounting and auditing department since 1937.

The Torrington Co., Torrington, Conn., and South Bend, Ind., has moved its Chicago office to 4352 W. Roosevelt Road.

Waukesha Motor Co., Waukesha, Wis., has appointed Lloyd L. Bower as chief engineer, succeeding James B. Fisher, who retired on January 31, after 35 years of service with the company, according to an announcement by James E. DeLong, president. Mr. Bower has been active in the engineering department for more than 20 years and



L. L. Bower

as Mr. Fisher's assistant for 10 years. He is a graduate of the University of Michigan, School of Engineering, class of 1916. Following World War I, in which he served as Sergeant of the 21st (Light Railway) Engineers in France, he joined the Garford Truck Co., Lima, Ohio, as layout draftsman and transmission specialist. In 1921 he became assistant to the chief engineer of the Transport Truck Co., Mt. Pleasant, Mich., later returning to the Garford Co. where he remained until his appointment as installation engineer for Waukesha Motor Co. in 1927.

The D-A Lubricant Co., Inc., Indianapolis, Ind., has appointed Warren Earl Moore as sales and service representative for southern Illinois.

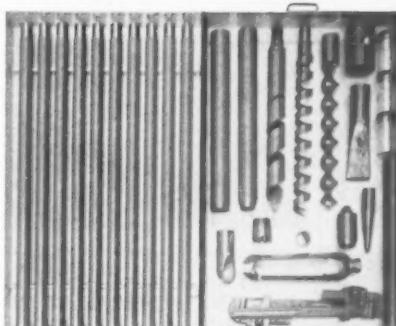
Chase Bag Co., Chicago, Ill., recently held its third annual Quarter Century Club dinner at which two sisters, Ruth and Cecilia Perelman were presented certificates and diamond service pins.

Hewitt-Robins, Inc., Buffalo, N. Y., has appointed John Burkhardt as traffic manager of the Hewitt Restfoam Division. He is also continuing in the same capacity in the Hewitt Rubber Division, where he has served for many years. Thomas P. McNiesh has been appointed sales representative for the Hewitt Rubber Division, in the Los Angeles territory, and Hall S. Derkin will represent the division in the Chicago area. Bornell Supply Co., Inc., Piqua, Ohio, has been named distributor of Hewitt industrial rubber products in Piqua and surrounding territory.

Hardinge Co., Inc., York, Penn., announces the appointment of Robert L.

(Continued on page 152)

SOIL SAMPLING KIT



TWELVE SOIL AND EARTH
SAMPLING TOOLS IN HANDY
STEEL BOX

CAN BE CARRIED IN ANY
AUTOMOBILE

ACCURATE SAMPLES OF EARTH
AND SOIL MATERIALS

Thirty years' experience has proved these tools will recover accurate samples from practically all earth materials.

MANY USES include exploring aluminum silicate deposits - brick and clay materials - foundation test borings - gold bearing sands - kaolin and clay for ceramics - sand and gravel pits - subgrade testing for highways and airfield runways - base materials. For soil cement stabilization.

SEND FOR LITERATURE

ACKER DRILL COMPANY, INC.
SCRANTON 3, PENNSYLVANIA



Sauerman Blackline Cableway digs gravel from lake and delivers 75 cu. yd. an hour to plant at cost of few cents a yard.



This shows how a Sauerman scraper with high tail tower handles a 25,000-ton stockpile of phosphate rock at Florida drying plant.



**Dig, Haul, Dump
at Lowest Cost**

with a

**SAUERMAN
MACHINE**

GRAVEL excavation and stockpiling are two jobs at which Sauerman Scrapers and Cableways excel. This long range equipment is very flexible and is easily adapted to the exact requirements of each particular job, whether working deep under water, in a clay formation, on a hillside, in a swamp, or moving bulk materials into and out of stockpiles.

The first cost of a Sauerman installation is reasonable, maintenance amounts to very little, and the simplicity of operation makes it possible to place the control of even the largest installation in the hands of one operator. Write or wire for Catalog.

SAUERMAN BROS., INC.

530 S. Clinton St., Chicago 7, Ill.

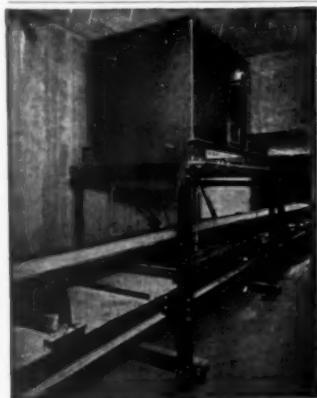
STEEL

**Every Kind
Quick Delivery**

**Plates, Structural,
Bars, Sheets, Tubes, etc.
Carbon, Alloy, Stainless
Steels, Babbitt Metal.**

RYERSON

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco



Plants handling Cement, Lime, Gypsum, Sand, Gravel, Crushed Stone etc. use the WEIGHTOMETER for fast accurate production.

WEIGHTOMETER gives a continuous, automatic, and accurate weight record of materials in transit at an extremely low operating cost. All producers of bulk materials handled by belt conveyors need this dependable check on production figures supplied by MERRICK WEIGHTOMETEER.

**Merrick Scale Mfg. Co.
Passaic, New Jersey**

Baldwin as assistant to G. A. Wallerstedt, western district manager. He will be in sales development, with headquarters in San Francisco.

Chase Bag Co., Chicago, Ill., has announced the appointment of R. V. Bradley as sales manager of the East-



R. V. Bradley



James W. Wells

ern paper bag division, with headquarters in New York, N. Y. Mr. Bradley was formerly manager of the New York City sales office, which position will be taken over by W. J. Newhouse. James W. Wells has been named sales manager of the Portland, Ore., branch. He succeeds Robert R. Koch who was recently made manager of the newly acquired factory in Los Angeles, Calif.

Lake Shore Engineering Co., Iron Mountain, Mich., has announced formation of a conveyor division to manufacture and sell Tote-All and Coal-toter conveyors formerly manufactured by Material Movement Industries, Inc., Skokie, Ill., which will be dissolved. Horton Conrad, president of the latter company, has been appointed to direct sales of the new division.

United States Rubber Co., New York, N. Y., has appointed Edward L. Lockman as manager of tank lining and roll covering sales. He has been assistant sales manager since 1938. From 1942 to 1945 he served in the U. S. Army, attaining the rank of captain. He returned as assistant sales manager in December, 1945.

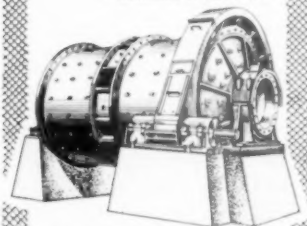
Bucyrus-Erie Co., South Milwaukee, Wis., has appointed the Gibbs Corp., Jacksonville, Fla., as distributors for the company's shovels, dragshovels, draglines, cranes, and the Hydrocrane throughout north-central Florida. Territory includes counties of Gadsden, Liberty, Franklin, Hernando, Sumpter, Lake, Osceola, Indian River, Levy, Marion, and Brevard. Southern Florida will continue to be served by Llewellyn Machinery Corp., Miami, and Eperson & Co., Tampa.

The B. F. Goodrich Co., Akron, Ohio, has announced the appointment of Glenn E. Martin as advertising manager for the replacement tire sales division. He joined the company in 1933, became advertising manager of the group buying and selling organization in 1939, and was appointed manager of retail advertising for the replacement tire sales division in 1941, holding that position until several months ago when he was appointed division manager of sales planning.

MARCY Center Peripheral Discharge Rod Mills

for Sand Production

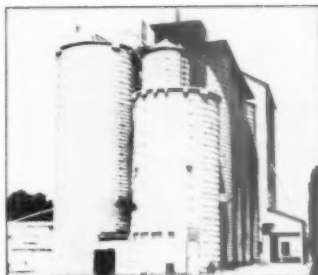
- Gradation Flexibility
- Proper Particle Shape
- Low Production Cost
- Continuity of Operation



Write for Additional Information

MINE & SMELTER SUPPLY CO.

Denver Salt Lake City El Paso
1775 Broadway, New York



FAST in Two Senses

Because the Super-Concrete Staves lay up readily, Neff & Fry Storage Bins are erected fast; i.e., in a comparatively short time.

The staves interlock together firmly. The tiers are securely bound with heavy galvanized steel rings. The materials are enduring. So Neff & Fry Bins stand fast; i.e., ruggedly, for a long time. Experience over a period of almost 30 years proves that Neff & Fry Super-Concrete Stave Storage Bins serve from one generation to the next with virtually no upkeep cost. Many of the leading manufacturing, processing, mining, quarrying, distributing, and transportation companies of the country will testify that this is true.

We'll gladly give you the evidence. Get it before you contract for storage bins. Write, wire, or phone us.

THE NEFF & FRY CO.
CAMDEN, OHIO

For All Sorts of Bulk Flowable Materials

NEFF & FRY STORAGE BINS

industrial OIL AND GAS BURNING EQUIPMENT

- Mechanical Atomizing Oil Burners
- Steam Atomizing Oil Burners
- Refractory Burner and Muffle Blocks
- Industrial Gas Burners
- Low Air Pressure Oil Burners
- Fuel Oil Pump Sets
- Valves, Strainers, Furnace Windows
- Tandem Block Combustion Units
- Combination Gas and Oil Burners

Detailed information gladly sent you upon request.



**NATIONAL
BURNER COMPANY INC.**

1299 EAST SEDGLEY AVENUE, PHILADELPHIA 26, PA.
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THIS BOOKLET MIGHT SAVE YOU MANY HOURS OF PRECIOUS WORKING TIME

Tells how to keep rotary kilns running when trouble occurs—either permanently or until replacement parts can be secured. Better still, it tells how to **PREVENT TROUBLE** through proper precautions in setting up kilns and by watching out for conditions which may cause trouble if not corrected. Twenty pages—fully illustrated. Free on request to any one who can use it to advantage. Ask for Bulletin No. 389.

Vulcan Iron Works
WILKES-BARRE, PA., U. S. A.

FINANCIAL

RECENT DIVIDENDS

Arundel Corp.	.25	Apr. 1
Bessemer Limestone & Cement	.25	Apr. 1
Bessemer Limestone & Cement pf.	.50	Apr. 1
Bessemer Limestone & Cement pf.	.50	July 1
Gypsum Lime & Alabastine sp.	.25	June 1
Gypsum Lime & Alabastine sp.	.25	Sept. 1
Gypsum Lime & Alabastine sp.	.25	Dec. 1
Hercules Cement Corp.	.50	Apr. 1
Melroe Portland Cement Co.	.50	Apr. 5
National Gypsum Co.	.25	Apr. 1
Pacific Portland Cement Co.	.75	Apr. 15
Pennsylvania Glass Sand	.40	Apr. 1
Pennsylvania Glass Sand pf.	1.25	Apr. 1
Standard Paving & Mat. Ltd.	.50	Apr. 1
Standard Silica Corp.	.12½	May 14
U. S. Gypsum Co.	.75	Apr. 1
U. S. Gypsum pf.	1.75	Apr. 1

ALPHA PORTLAND CEMENT CO., Easton, Penn., has published the following account of income for years ended March 31:

	1949	1948
Net sales	\$19,521,226	\$16,105,819
Oper. expenses	11,967,410	10,361,644
Maintenance and repairs	2,437,963	2,051,142
Depreciation and depletion	671,509	605,583
Operating profit	4,844,345	3,087,449
Other income, net	247	2,196
Total income	4,844,098	3,089,645
Fed. income tax	1,873,246	1,219,420
Net profit	2,970,852	1,870,225
Dividends	1,252,748	1,179,162
Surplus per share	1,718,504	697,534

BESSEMER LIMESTONE & CEMENT CO., Youngstown, Ohio, lists the below consolidated account of income for years ended December 31:

	1948	1947
Net sales	\$5,836,350	\$4,631,568
Costs and expenses	3,764,499	2,897,681
Depreciation and depletion	211,865	166,579
Oper. income	1,859,986	1,567,307
Other income	38,044	28,196
Total income	1,898,030	1,595,503
Fed. income tax	711,000	600,000
Pr. yr. inc. tax	51,039	—
Net income	1,135,990	995,503
4% pfd. divs.	20,612	20,946
Common divs.	748,020	523,614
Surplus for year	367,358	450,943
Earn. surplus, 1-1	1,112,278	661,538
Earn. surpl., 12-31	1,479,637	1,112,278
Earn., pfd. share	\$111.61	\$95.58
Earn., com. share	7.46	6.51
No. of pfd. shares	10,178	10,415
No. of com. shares	149,604	149,604

CALAVERAS CEMENT CO., San Francisco, Calif., had a net income of \$710,287 on net sales of \$4,264,060 in 1948, as compared with net income of \$236,573 on sales of \$2,962,700 in 1947.

IDEAL CEMENT CO., Denver, Colo., presented the following consolidated statement of earnings for the years ended December 31:

	1948	1947
Sales and other rev.	\$24,973,795	\$18,205,522
Cost and expenses	15,235,535	11,765,660
Depreciation, depletion, etc.	1,715,009	1,019,313
Net oper. profit	8,023,251	5,420,549
Pr. yr. adjust.	86,029	—
Tax int. refund	112,708	—
Other income	430,299	429,449
Total income	8,652,287	5,859,998
Interest	99,076	9,208
Income taxes	3,592,000	2,390,554
Net income	4,961,211	3,470,232
Dividends	2,343,817	2,205,781
Surplus for year	2,617,394	1,264,451
Earn. surplus, 1-1	5,743,239	4,475,838
Earn. surpl., 12-31	8,360,683	5,743,239
Earned per share	\$3.60	\$2.52
Number of shares	1,379,213	1,378,813

INDUSTRIAL SILICA CO., Youngstown, Ohio, had net earnings of \$267,389 or \$1.60 per share of common stock for 1948 compared with earnings of \$165,645 or \$0.64 per share for 1947. Net sales were \$680,959 last year as against \$482,886 in 1947.

4 days' work! now done in 3

with
JAEGER
"air plus"
pressure*



Model 125—Runs 2 heavy or 3 medium breakers or heavy rock drill at full 90 lbs.

*With steady 90 lbs. pressure, instead of 70 lbs., air tools hit enough harder and faster to do 30% to 40% more work in the same number of hours.

Jaeger's new standard ratings (the first increase in the industry since 1932) give you the air you need to run today's big tools at steady 90 lbs. pressure—75 ft. of air instead of 60—125 ft. instead of 105—185 ft. instead of 160—250 ft. instead of 210—365 ft. instead of 315—600 ft. instead of 500.

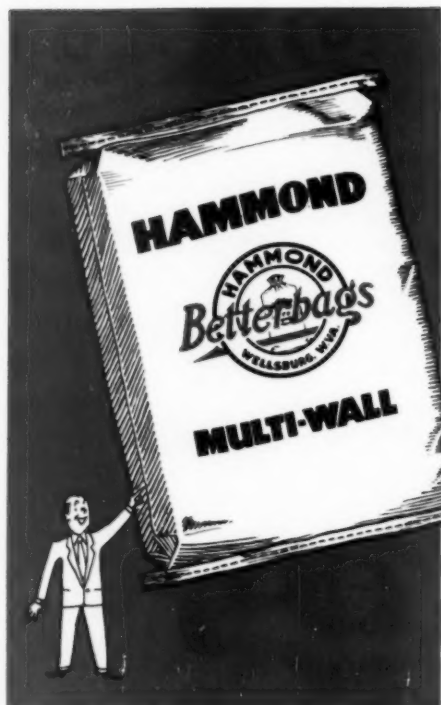
If you're interested in cost-cutting—producing 4 days' work in 3—put a Jaeger Air Plus on your next job.

Model 600—Runs 2 big 4" wagon drills at 90 lbs., drilling 30% to 40% more footage than you get with any 500 ft. compressor.



See your Jaeger distributor or write
THE JAEGER MACHINE CO.
Columbus 16, Ohio Cable: BIGANLITE

Pumps • Mixers • Hoists • Towers
Bituminous Pavers • Aggregate Spreaders
Concrete Spreaders • Finishers



HAMMOND Multi-Wall BAGS

SEWN • PASTED • OPEN MOUTH • VALVE STYLE

... meet all requirements for safe,
dependable shipment of cement,
lime, plaster, limestone, rockwool, etc.

They're attractive and economical!

Write for quotation on your needs!



HAMMOND BAG & PAPER CO.

GENERAL OFFICES: WELLSBURG, W. VA.

Plants in Wellsburg, W. Va., and Pine Bluff, Ark.

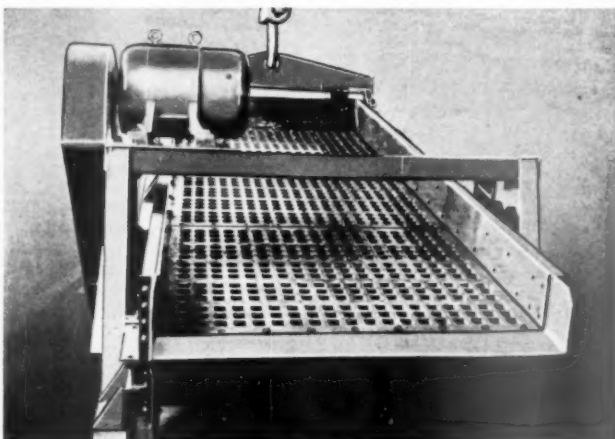
HENDRICK PERFORATED METAL PLATE

on a gyrating screen

This popular heavy-duty scalping unit is equipped with a 5' x 14' Hendrick metal plate with square perforations.

Hendrick Perforated Plate can be supplied, either flat or corrugated, with any desired shape and size of perforation, in tank, high carbon, high tensile, and abrasion-resisting steels, and in other commercially rolled metals.

It maintains uniformity of mesh throughout an unusually long service life. Its full clearance obviates clogging, and the ease with which decks can be changed minimizes labor costs. Write for detailed information.



Perforated Metals
Perforated Metal Screens
Architectural Grilles
Milco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

HENDRICK

Manufacturing Company

47 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

CONCRETE PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE



Ready-mixed concrete batching plant
of Rocklite Products, Ventura, Calif.

A SECTION OF
ROCK PRODUCTS

"WHAT PRICE ABRACADABRA?"



Abacadabra is expensive. Many of you found that out years ago. You practically had to use black magic to figure your costs which were based on truck mixer operation. Indefinite capacities, "outlaw" sizes, rapid changes in ratings—all combined to make abracadabra confusion a big expense.

That's why the Truck Mixer Manufacturers Bureau was formed—to eliminate that costly abracadabra. We set standards which guarantee size and capacity. And we put a rating plate on each truck mixer. The Bureau has taken the mumbo-jumbo out of figuring truck mixer operating costs, and erased the confusion of "outlaw" sizes.

We think you prefer it this way—with established standards and a rating plate to guarantee size and capacity. Look for that plate, and read it with confidence.



Truck Mixer Manufacturers Bureau

Affiliated with The National Ready Mixed Concrete Association

BLAW-KNOX DIVISION
Pittsburgh, Pa.

CHAIN BELT COMPANY
Milwaukee, Wis.

CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.

THE JAEGER MACHINE COMPANY
Columbus, Ohio

WORTHINGTON PUMP & MACHINERY CORP.
RANSOME DIVISION, Dunellen, N. J.

THE T. L. SMITH COMPANY
Milwaukee, Wis.

INDUSTRY NEWS

Washington Ready-Mixed Concrete Plant

GEORGE SCOFIELD Co., described as the only firm with a central pre-mixing concrete plant in Tacoma, Wash., in an article appearing in the *Tacoma Times*, was started in the late 1880's on its present site by George Scofield, dealing at that time in sand, gravel and cement. The company now is owned jointly by Arthur Sivertsen, John Diven, Roy McGinn and Elmer Alskog.

A fleet of 40 trucks, including standard and three-axle mixers, flat bed and dump trucks, is employed for delivery of pre-mixed concrete and sand and gravel. Other building materials handled by the company include ready-mixed lime mortar, brick, building tile, fire brick, cement, waterproofing, plaster and lath, sewer pipe and drain tile.

Series of Articles on Air-Entrained Concrete

HERCULES STEEL PRODUCTS CORP., Galion, Ohio, has made available a series of articles on air entrained concrete, written by J. A. Nicholson, president of the Nicholson Concrete Co., Toledo, Ohio. The author, whose central mixing plant is said to be one of the largest in the middle west, presents both pros and cons for air entrainment in the articles, examining every phase of central mixing plant operations—mixing equipment, controls, testing equipment, aggregates, location of plant in relation to the site of the pouring job—recommending that unless overall conditions permit the production of consistent, uniform quality concrete, it is better to stay away from air entrainment. Advice is given on how ideal condi-

tions may be attained to make air entrained concrete practical and profitable. The author also explains the chemical and physical aspects of air entrainment with statistics to show that properly mixed, properly delivered and properly placed air entrained concrete is more workable, more plastic, more cohesive and more uniform throughout than other type mixes. A comprehensive study of the problems of delivery and placement of air entrained concrete, and a listing of the requirements for delivery equipment are included.

N.R.M.C.A. Safety Contest

NATIONAL READY MIXED CONCRETE ASSOCIATION has announced that its third annual safety contest will cover the period July 1, 1948, through June 30, 1949, and will again consist of two groups: the larger plant group, including those companies producing 40,000 cu. yd. of concrete during the contest period; the smaller plant group, including those companies producing 40,000 cu. yd. or less during the contest period.

Completes Plant Expansion Program

UNIVERSAL CONCRETE PIPE CO., Columbus, Ohio, has announced completion of a \$50,000 expansion program at its Decatur, Ala., plant. Improvements are said to triple production capacity. George D. Sims is plant manager.

FREEBURG CONCRETE PRODUCTS CO., Freeburg, Ill., has been incorporated by John P. Wylie, Rosie Mae Wylie, Bertram B. Oelrich, and Margaret M. Oelrich.

Inspect Pipe Line

OFFICIALS of Universal Concrete Pipe Co., Columbus, Ohio, and public officials and engineers in the New York area recently inspected the newly installed rubber-coupled concrete pipe drainage system at the Philadelphia airport. The system is said to eliminate excess water on the surface of the runways, and insure non-cracking and buckling of the surface.

KENTUCKY CONCRETE PIPE CO. has started construction of a \$25,000 plant at Louisville, Ky., to replace an old plant previously operated by the concern. W. M. Lafferty is manager.

MITCHELL CONCRETE PRODUCTS has announced plans for construction of a ready-mix concrete plant at Mitchell, S. D. Capacity of the plant will be 75 cu. yd. per day for the present, but later this will be doubled.

JACK LESUEUR and ART MARTIN have established a ready-mixed concrete plant at Olathe, Kan. The plant has 110-ton storage bin capacity, and two International truck-mounted transit mixers for delivery.

WATKINS CEMENT BLOCK and SUPPLY CO., Flint, Mich., owned by David T. Watkins, is producing concrete block measuring 16 x 8 x 4 in., and dyed to eliminate the necessity of paint or other exterior finish coatings. The company also manufactures brick, drain tile, and chimney block.

PORTAGE CONCRETE CO. has been opened at Portage, Wis., A. L. Brown, owner, has announced. The new plant will handle ready-mixed concrete, washed sand and gravel, and will do various types of contract work.

PLIMCE CONCRETE PRODUCTS, INC., St. Louis, Mo., has been organized by J. L. Stucker, A. E. Anderson, and E. J. Sacket. The plant will manufacture concrete masonry block, brick, plaster, tile, etc. Capitalization is listed as \$500, with 600 shares, par value \$50.

J. C. BOND TILE & TERRAZZO CO., Dallas, Tex., has leased the Dallas Dunbrik Manufacturing Co., also of Dallas, from A. W. Skelton. Joe H. Bond will operate the newly acquired plant, which also will produce concrete septic tanks and drain tile for the local market.

CHESTER CONCRETE PRODUCTS CO., Columbia, S. C., has been organized by J. C. Long for the manufacture of concrete block and brickettes, ready-mixed concrete and other concrete products. A. C. Chandler is plant manager.

TRIPLE E. BLOCK CORP., Eau Claire, Wis., has been organized with 2500 shares, par value \$10, and a minimum capital of \$500, to manufacture building block and other concrete products. Elmer L. Gorton, Armin H. Kohlhepp, and Francis J. Wilcox are the incorporators.



Jack Crabbs, a member of the firm of Austin Crabbs, Inc., Davenport, Iowa, which manufactures Celocrete lightweight masonry units and other building materials, has constructed his own home of the Celocrete aggregate units. Designed by Mr. Crabbs, the house, shown above, is approximately 116 ft. long by 46 ft. and is of double wall construction, with an inner wall of 8-in. block and an outer wall of 4-in. units made with rose quartzite aggregate and cement tinted to match. The wall units have been core-filled with dry, coarse Celocrete aggregate and left exposed and unpainted in all rooms. In order to avoid bonding two materials with different coefficients of expansion, the exterior wall stands free, with the roof and floor slabs supported only on the inner wall block. Floors are of concrete, dye-chrome-treated and waxed.

ANOTHER SMITH TRIUMPH...

New Giant 6 Yard Mixer

50%
Greater Capacity

LIGHTWEIGHT
LOW HEIGHT
COMPACT
LOW COST
LONG LIFE



BACKED by SMITH...

CONCRETE MIXER MANUFACTURER SINCE 1900

Giant in Performance and Output!

Again Smith steps out with a great engineering achievement. This time it's a huge 6 Yard Tilter... the world's largest concrete mixer... 50% bigger than its biggest predecessor. It gives you 50% greater output with the same labor, power and general overhead costs. Just the right batch to fill a 4½ yard truck-mixer (6½ yard agitator).

This new 6 yard mixer is a giant in performance and output. But its weight, length, height, initial cost and cost of operation are all surprisingly low. Like all Smith Mixers, this 6 yard Tilter is designed for heavy duty service, with long life and low maintenance cost.

All superior features of Smith Tilters are retained... fast loading, rapid discharge without segregation, complete control of discharge and, of course, the famous Smith end-to-center mixing action. The ideal machine for dams and large projects, as well as Ready-Mix plants. Write for new Bulletin 244, just off the press.

THE T. L. SMITH COMPANY

2885 N. 32ND ST., MILWAUKEE 10, WIS., U. S. A.



LOOK! JOE... I made this cut
with my Clipper in 5 seconds!



SOLD DIRECT
from Factory to User

PACKED WITH 1949 FEATURES

DUSTLESS CUTTING WITH MODEL HD

The outstanding Self-Contained Circulating Water System on the 1949 Model HD makes possible Completely DUSTLESS Cutting. Yes, completely DUSTLESS cutting for intricate jobs in confined areas. When dust is no problem merely turn the pump valve for dry cutting. No, you don't have to disconnect the pump on the Model HD Clipper to cut dry for it is to eliminate such time consuming adjustments.



**BLADE PRESSURE
EQUALIZER**

That smooth, sensitive cutting action on every Clipper is a result of another exclusive Clipper feature, the Pressure Equalizer Spring with its Automatic Action.



**ADJUST-A-CUT
CONTROL**

Clipper's exclusive "Adjust-A-Cut" Control—just pull the knob to instantly lower or raise the cutting head for materials of varying sizes. A "One-Man" operation!



**SNAP-ON
BLADE COVER**

A Clipper feature that lets you cut wet—without getting wet! An outstanding safety feature for both wet and dry cutting operations.

Yes...

CLIPPER MASONRY SAWS
Make *Any* Cut Quickly and Easily!

Yes, you can slice through the hardest materials in seconds with the 1949 Clipper Masonry Saws. Smoother, faster cutting action than ever before. You'll find Clipper's the Genuine answer to any masonry cutting problem. Contractors agree on the New wet or dry cutting Model HD for the 100% Answer to ALL masonry problems. Actually the HD is Two Saws In One—it will meet your DUSTLESS cutting requirements in confined areas and will cut dry for outside operations. Every Clipper Masonry Saw is GUARANTEED, "To provide the Fastest Cut . . . at the Lowest Cost . . . with the Greatest Ease . . . Any Time . . . Any Where!"

**Not 1... But Nine
New 1949 Models!**

Nine New 1949 Clipper models available on FREE TRIAL and each with outstanding features for smooth, fast and economical Clipper Cutting Action. See why Clipper, the original masonry saw, is acclaimed OUTSTANDING! See the "Adjust-A-Cut" Control; "Snap-On" Blade Guard Cover; and the "Streamlined" Ball Bearing Conveyor Cart. Remember—not 1 but NINE MODELS!



**FREE
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Precast Bridges

Setting precast bridge members in place . . . new, permanent bridge installed in less than 3 hours. Guard rail and wearing surface placed later.



Pennsylvania Highway Department replaces outmoded bridges on secondary road system with precast concrete structures

Members fabricated with 'Incor' Air-Entraining Cement



ON THE alert for ways and means of reducing today's construction costs, the Concrete Products Co. of America, in cooperation with the Pennsylvania Department of Highways, has developed a method of precast concrete bridge construction which is producing outstanding results. Following exhaustive tests, 14 bridges, with spans up to 24 ft., have been ordered in the last few months, and spans up to 36 ft. are now contemplated.

As the Pennsylvania Department of Highways uses air-entraining cement in highway construction, the Department approved the use of 'Incor'® Air-Entraining 24-Hour Cement in fabricating the bridge members. Faster, thorough curing and quicker re-use of specially designed forms helped speed economical production. Vacuum process was used to reduce water content of the placed concrete.

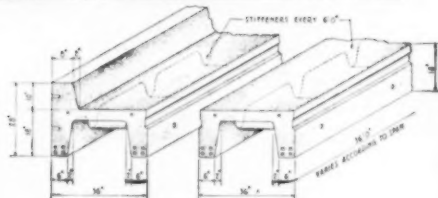
With literally thousands of bridges throughout the country in need of replacement, this speedy, economical method of minimizing traffic disruption and lengthy detours has a tremendous field of usefulness.

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 27,000,000 BARRELS ANNUAL CAPACITY



Plant of Hunziker & Cie., A. G. Brugg, Switzerland, where both sand-lime brick and concrete products are manufactured. Smoke stack, center, is from power plant of brick operation

Concrete Products and Sand-Lime Brick Produced in Same Plant

Swiss firm makes centrifugally cast concrete pipe and other products of high compressive strength in plant with 300 ton per day capacity of all types of unit

IN THE FIELD of concrete products manufacture in Switzerland, there is found a large variety of products produced under standards which in-

By LOUIS S. PHILLIPP, JR.

sure the highest quality and produced in large quantities.

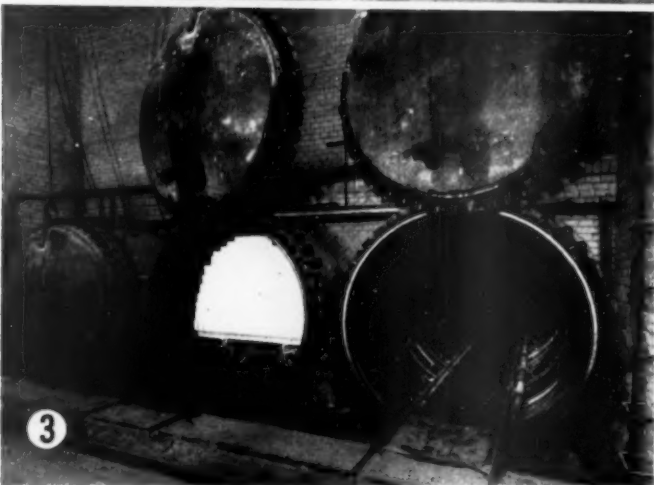
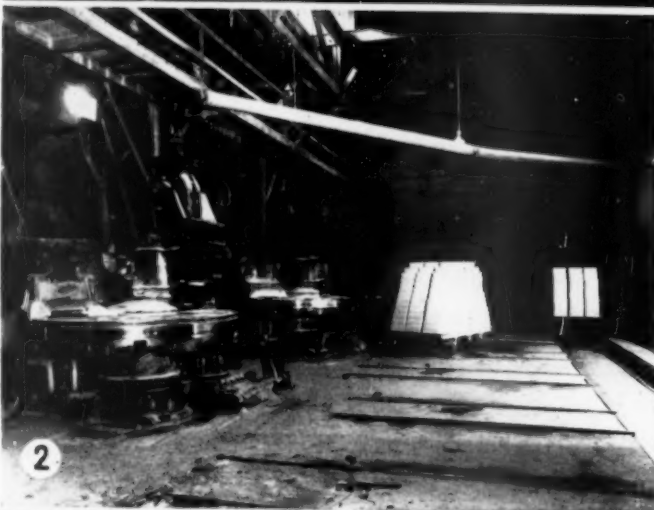
One of the most modern of the concrete products plants in Switzerland is located at Brugg, in the northwestern part of the country in a region where Switzerland's largest cement plants are located. The plant is one of those operated by Hunziker & Cie., A. G., of Zurich. The company itself is the oldest of its kind in this part of Europe and was founded by Johannes Hunziker in 1874 just after he first introduced cement into Switzerland from England.

The present company, with main offices in Zurich, owns and operates concrete products plants in Brugg, Olten, Pfaffikon, Bern, and Zurich, producing all varieties of products, and in connection with these plants, operates its own sand and gravel and cement plants. An earlier article on the Hunziker process, covering manufacture of "flint-lime" brick and "Superbeton" concrete pipe, appeared in the December, 1948, issue of ROCK PRODUCTS.

The Brugg plant produces concrete products of all types but the main emphasis is on the production of reinforced concrete pipe. Pipe is produced in many sizes from that having an in-



Covered storage facilities for finished sand-lime brick. Note cube of brick on pallet being loaded on railroad car, background



side diameter of 4 in. to the largest which are 78 in. inside diameter. Lengths vary to a maximum of 13 ft.

Since pipe and other products are produced according to orders received from contractors, or to keep stocks adjusted, it is hard to judge the capacity of the plant. It is usually stated that it produces 30 freight carloads of products of all types per day, or about 300 t.p.d. The plant normally operates only one shift per day.

Sand and gravel is supplied from a pit located right at the plant. The pit produces about 40,000 cu. yd. per year. Cement is shipped in from the sister plant of the company at Olten, about 20 miles away.

The graded sand and gravel for the manufacture of the concrete pipe is stored in silos located at the top level of the three story plant and is fed by gravity to an automatic measuring system which picks up the ingredients by weight and dumps them into a large circular mixing machine located a good distance above the pipe forming machines. This allows the mixed concrete to be fed downward into the troughs of the pipe-forming machines. The concrete mixer is of the German Eirich system and is powered by an Oerlikon 20-hp. motor which operates the weighing device and a 35-hp. motor which drives the mixer.

The weighing system uses five buckets which, when filled with gravel or sand, dump into the mixer. Three are for various sizes of gravel, one is for sand, and one is for cement, and, when filled to a predetermined limit, each bucket shuts off automatically. The system is adjusted to the following mixture by weight: 176 lb. of gravel, 176 lb. of middle-size gravel, 176 lb. of coarse sand, 99 lb. of fine sand, and 165 lb. of cement. Weighing and measuring equipment is from the Hennefer Maschinenfabrik in Germany.

Reinforcements for the pipes are made by winding heavy steel wire on slowly revolving drums corresponding to the size pipe being made. The drum revolving machine was company built to handle drums of any size or length and, in addition to turning slowly, moves laterally to facilitate the winding of reinforcements. After reinforcement, the drums are placed on stands where they are rotated and welded into a solid core by the addition of longitudinal rods. By releasing inner tension springs in the drums the finished reinforcement can slide off easily.

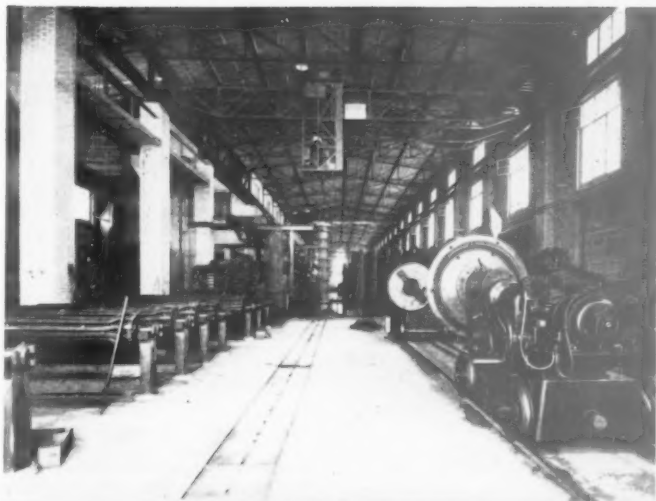
A large 12-ton overhead crane, manufactured by the Oerlikon Maschinen Fabrik (Zurich), is used for lift-

1. Closeup of brick press. Molds are readily changed to produce size and style of brick desired. 2. Four brick presses similar to the two on the left, produce approximately 125,000 brick per eight hr. day. 3. Autoclaves where sand-lime brick are cured under steam pressure for seven hours. These autoclaves have doors at both ends, are 60 ft. long and have a capacity of approximately 12,000 brick each

ing molds and pipe. After the crane brings an empty mold to this section to pick up a finished reinforcement, mold and reinforcement are carried back into place in one of the pipe-forming machines. These rotate the mold at reduced speed while concrete is introduced from a long feeding arm or trough, entering at one end and distributing evenly along the length of the pipe. Centrifugal force forms an average pipe in about 15 min. Three pipe forming machines are used in the Brugg plant, the largest of which is powered by a 1400-hp. motor and drives the mold at a speed of 600 to 700 r.p.m. The largest pipe produced weighs over five tons. The smaller pipes are formed by being turned at speeds varying up to 1200 r.p.m. Capacity is approximately 15 large pipe in an 8-hr. shift.

Molds used by the company are under special patent and are said to be the only ones of their kind in Switzerland. They were developed and built by the company 15 years ago, and have numerous small holes on the outer surfaces, allowing excess water to be forced out, at the same time insuring that the inside surface of the pipe will be smooth and hard. The insides of the molds are lined with a fine silk fabric which insures a smooth outer surface for the pipe and allows the excess water an exit. The molds may be removed from around the pipe and used again immediately after pipe and mold are taken from the machine. The patented molds and rights to manufacture in this manner have been leased for use in England, Norway, South Africa (Johannesburg), Belgium and Portugal.

The pipes, after the molds have been removed, are left standing overnight in the molding plant in a moist



Interior of pipe-forming plant, top, as seen from end where reinforcing is made up for the pipe. Reinforcings are wound on drums, left; by machines, right. In the center of the top picture a pipe mold is being carried to the spinning machines by an overhead crane. Machines, left in bottom picture, are used for spinning the molds. Immediately behind spinning machine may be seen the long feeding mechanism for introducing concrete into the pipe molds. Finished pipe, right, have just been stripped of their molds and will stand 24 hr. before being moved



This large mold being placed in an upright position has just completed the spinning process on the machine to the right. The mold will be removed immediately, replaced on the spinning machine and the reinforcing, left background, placed in it for the next pipe. Pipe section shown here weighs over four ton and has walls about five in. thick

atmosphere maintained by a sprinkler system, and are removed the next day to soaking pits where they are cured for two weeks under water before use.

Certain of the smaller pipe sizes are produced without internal reinforcement. Equipment also is available to impregnate pipe with tar to insure them against the action of acids or other strong solutions.

The second important operation of the plant is the production of sand-lime brick which are produced at the rate of about 125,000 brick every 8 hr. These are made by pressing a dry mixture of lime, crushed gravel, and sand into the form of the brick and

then curing in large autoclaves under 117.6 p.s.i. of steam pressure for 8 hr. There are four autoclaves in which the bricks are cured, each about 7 ft. in diameter and 60 ft. in length, and normally holding 12,000 brick at one time.

Brick are made in various sizes and designs as desired, but an average unit is roughly 10 in. long, 5 in. wide, and 2½ in. high, and weighs 7.7 lb. The brick are formed in rotary machines under cold pressure of about 710 p.s.i., and are stacked on small carts which roll on tracks to the curing autoclave. When this is filled, the door is bolted in place and the



Impregnating pipe yields greater resistance to acids or other destructive liquids

bricks are left to cure for 7 hr. Steam pressure is maintained by a Ruegger & Co. blower, using raw oil as fuel.

The sand and lime are mixed and fed into molds in the automatic rotary presses, the molds filling as the presses rotate and as each mold comes under the pressure mechanism a brick is formed. A number of forms are available some of which have artistic exteriors, and were put into use at the request of architects.

The process of forming bricks under pressure from a mixture of sand and lime was introduced into Switzerland from Germany about 50 years ago. The four brick-forming machines are from Germany. The two smallest are Rohring Koenig machines and the two larger ones are from the Magdeburg Maschinen Fabrik. The presses are driven by 5-hp. electric motors.

Another special brick also is made under the same system; however, cement is used in the mix to insure greater durability. This type brick is used in tunnels and has found wide use in the well-known Alpine tunnels of Switzerland. The units are almost 14 in. long by 5 in. in width, and are 2½ in. high. They have repeatedly demonstrated the ability to withstand continuous pressures of more than 5600 p.s.i. and are recognized as one of the finest tunnel lining bricks available.

The plant employs altogether 160 workers and is the largest of those operated by Hunziker & Co. All phases of the work are carefully supervised and for each order placed with the company, the pH of the water in the area in which the products will be used is tested, for it has been found that this varies widely in this mountainous country, and the corresponding effect on the lime in the product must be taken into account in its manufacture. This is part of the extreme personal service of this company which extends even further in the production of other products.

Other products manufactured at the plant include all types of ditch forms, pipe forms, cable carrying pipe in two halves for underground installation, posts for fences of all sizes, telephone poles of concrete, bricks for building radial structures such as smokestacks, egg-shaped drainage pipe, every type of elbow and joint necessary, ceiling blocks for large buildings, foundation blocks, concrete window frames of many designs, concrete flower boxes, and many other forms.

Literally everything that can be, is made of concrete, and continuing research insures an even wider adaption of this versatile material.

Freezing and Thawing Tests on Concrete

NATIONAL READY MIXED CONCRETE ASSOCIATION, Washington, D. C., in a recent letter to member companies, presented the following reports on freezing and thawing tests of concrete containing various cements, various coarse aggregates and sands.

In the first category, a current investigation involves comparative tests with five brands of cement. The study involves tests of normal concrete made with quartz gravel, air-entrained concrete made with quartz gravel, and normal concrete made with trap rock. All concrete was designed to have 5.5 sacks of cement per cu. yd. and a slump of 3 to 4 in. Coarse aggregate was used in quantities of 0.66 units of dry-rodded aggregate per unit volume of concrete. About 6 percent of air was entrained in the air-entrained concrete through the use of Darex added to the mixing water.

Concrete made with cement No. 5 was highly resistant to freezing and thawing whether quartz gravel or trap rock was used as the coarse aggregate. Concrete containing cements 2, 3 and 4 showed relatively poor resistance to the freezing and thawing test while that made with cement No. 1 gave intermediate results. Relative performance with the various cements was about the same in concrete made with gravel and with trap rock. On the other hand, air-entrained concrete for all the cements showed excellent resistance to freezing and thawing. Tests, made of gravel concrete only indicated little difference between results from the five cements when about 5 to 6 percent of air was entrained.

Results of freezing and thawing tests of normal and air-entrained concrete containing six different coarse aggregates in general favored air-entrained concrete. Coarse aggregates, graded No. 4 to 2 in., were vacuum-saturated before being used in the concrete which was designed to contain 6 sacks of cement per cu. yd. and to have a slump of 1 to 2 in. Normal concrete contained less than about 1 percent of air as determined gravimetrically while that made with

Vinsol resin had 2.6 to 4.7 percent of air. A high grade quartz sand was used throughout the tests.

The air-entrained concrete was considerably more resistant to the freezing and thawing test than the normal concrete. This is true for all six coarse aggregates studied and particularly so for coarse aggregate Nos. 3, 4, 5 and 6. Other studies, however, have indicated that air-entrained concrete may not be much more resistant to freezing and thawing than normal concrete when the coarse aggregate used undergoes large changes in volume on being frozen.

In conducting freezing and thawing tests with various concrete sands, three sands were studied. One had a loss after 5 cycles of the magnesium sulfate soundness test of about 4 percent while two had losses of about 16 percent. Sands were saturated under a vacuum prior to use in concrete which contained about 5.5 sacks of cement per cu. yd. and had a slump of 3 to 4 in. Normal concrete contained approximately 2 percent of air while that containing an air-entraining admixture had about 7 percent. A high quality quartz gravel was used throughout the tests.

After 440 cycles, normal concrete containing the sand having a low loss in soundness tests withstood the freezing and thawing test as well as that with entrained air. In using the other two sands which showed relatively high losses in the soundness tests, concrete containing entrained air, showed higher resistance to the test than the normal concrete, and performed as well as concrete containing the sand with low loss in soundness tests. It was pointed out that it should not be concluded that these tests prove a relationship between the magnesium sulfate test of sand and resistance of concrete to freezing and thawing since other tests have shown that some sands with high losses perform as well as those with low losses.

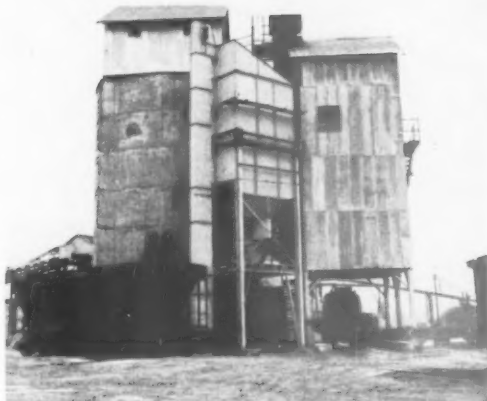
These investigations demonstrate that entrainment of air in concrete may improve the performance of many materials (cements, coarse aggregates and sands) when used in concrete subjected to freezing and thawing.

Load-Bearing Block

MONROEVILLE BRICKCRETE CORP., Norwalk, Ohio, is manufacturing a patented, concrete load-bearing building block twice the size of the common building block in five basic colors and several shades of pastel. The units are made from refractory limestone sand, cement, oxide for color, and densit, a water repellent ingredient. They are said to be water repellent and are manufactured to withstand pressures of 1800 to 2200 p.s.i. When full production is reached the plant will have a daily output of more than 4000 block.

New Ready-Mix Plant of Largest Gravel Producer

American Aggregates Corp. operates batching plant for central-mixed or transit-mixed concrete at sand and gravel operation, Richmond, Ind.



New batching and ready-mixed concrete plant of American Aggregates Corp. operation at Richmond, Ind.

THE AMERICAN AGGREGATES CORPORATION, which has its main offices at Greenville, Ohio, and operates plants at Indianapolis, Logansport and Richmond, Ind.; Detroit, Green Oak, Kalamazoo, and Oxford, Mich.; and Columbus, Urbana, Hamilton and Ft. Jefferson, Ohio, has recently installed a modern batching and ready-mixed concrete plant at its Richmond, Ind., operation.

Steam Generation

In a small room adjacent to the new plant, a Model 08-1 1/4-10, 125-lb. maximum pressure, fully automatic, oil-fired, Cleaver-Brooks steam generator, equipped with a Minneapolis Honeywell Pressuretrol, has been installed. Live steam jets are located in the bottom of the coarse aggregate bins so that the aggregate can be kept hot during freezing temperatures. The

equipment is said to be economical as to consumption of oil. On one 48-hr. test early in December, the unit consumed only 75 gal. of diesel fuel oil. The aggregates are so hot they cannot be held. Water for the batching plant is supplied from a small, vertical, deep well Fairbanks-Morse pump, powered by a 2-hp. motor, assuring a source of water for all plant purposes.

Aggregates are delivered to the plant by a 30-in. belt on Rex idlers that runs in a reclaiming tunnel under the aggregate storage pile, delivering to three gravel bins and one sand bin. Bulk cement is delivered by rail, with storage facilities for 1 1/2 car loads. From the cement silo the material is delivered up to an enclosed scale hopper by an inclined spiral conveyor. This design helps to control surges from the cement silo. The silo is

charged by bucket elevator. Cement is weighed automatically using Butler Bin equipment with Howe scales on the 5-beam unit. The water is measured in a Neptune meter. Scale hoppers are provided with vibrators to facilitate truck loading.

Weigh Batcher

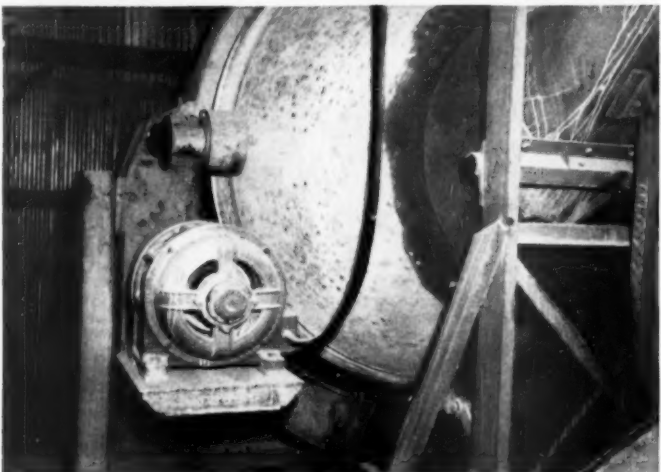
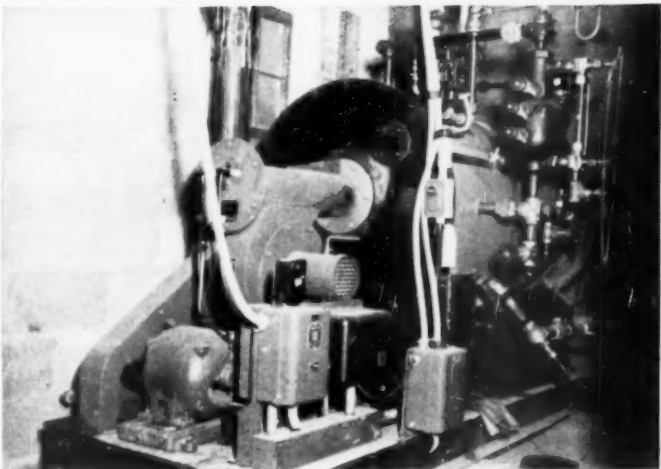
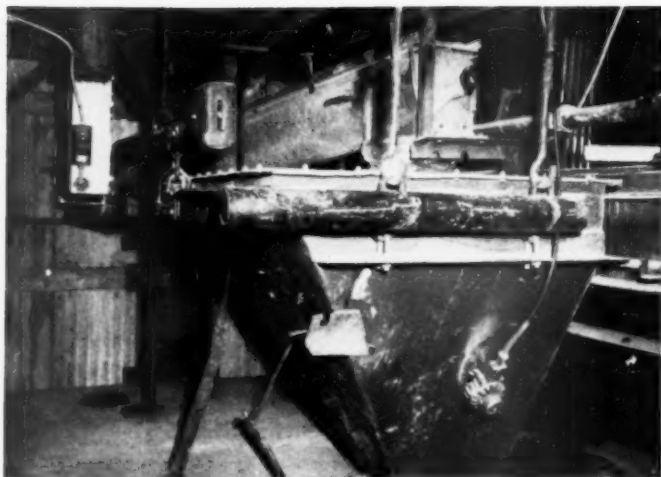
The weigh batcher is designed to deliver dry mixes direct to mixer trucks, or the mixes can by-pass to a Model 56-S Smith mixer, operating at 11 1/2 r.p.m. A 25-hp. G. E. motor rated at 1200 r.p.m., drives the mixer. The unit has a rated capacity of 56 cu. ft.



Sand and gravel plant in background produces the aggregate for new ready-mixed concrete plant. Aggregates are delivered by 36-in. belt conveyor in foreground that runs in a reclaiming tunnel under the storage pile



Fred Lomb, manager of the Richmond operations, left, and W. Ross, in charge of construction of the new ready-mixed concrete plant



The company has assigned five Jaeger mixers to this operation: three 4½ cu. yd. and two 3½ cu. yd. units that ride three International, one Mack, and one Studebaker chassis.

F. D. Coppock is president of the corporation, Guy C. Baker is vice-president, William Edward Hole is secretary-treasurer, J. C. Patty is chief engineer and F. H. Grant is district manager in charge of all operations in Indiana.

Top: Weigh batcher designed to deliver dry mixes direct to trucks, or to a mixer. Cement is received from screw conveyor shown at top of illustration. Center: Oil-fired steam plant delivers steam to aggregate bins so that the materials are kept hot at all times. Bottom: Mixer, operating at 11½ r.p.m., is driven by a 25-hp. motor

Lightweight Aggregates

A REVIEW OF the better known lightweight aggregates, briefly outlining methods used in their manufacture, quarrying sites, expansion plant locations, and comparative weights has been issued by the Office of the Housing Expediter, Washington, D. C.

Six types of aggregate are discussed in detail, the first of which is expanded shale and clay, or Haydite. Weight of a cubic foot of Haydite is reported to range between 40 and 60 lb., depending on amount of expansion and mesh size of the specimen. Haydite concrete, according to a chart in the book, is in the weight range of 100 to 120 lb. per cu. ft.; and a modular 8- x 8- x 16-in. block weighs approximately 27 lb.

Aggregates in the report are classed in descending order by their reported weights, with foamed slag appearing next with the same weight range per cubic foot of dry material, but the concrete weight ranges from 90 to 100 lb. per cu. ft. Processed pumice is next, with a weight per cubic foot of 30 to 60 lb. and a concrete weight of 60 to 90 lb. per cu. ft. Mention is made of the use in Germany of pumice as an aggregate for the manufacture of hollow floor and wall slabs, with the claimed advantages of heat and sound insulation, fire resistance and a surface to which plaster may be applied.

Diatomite aggregate has a weight range of 23 to 40 lb. per cu. ft. and diatomite aggregate concrete weighs 55 to 70 lb. per cu. ft. Perlite, processed as an aggregate, is reported to weigh 6 to 16 lb. per cu. ft., with its concrete in the 40 to 65 lb. per cu. ft. class. Vermiculite, the last material considered, weighs 6 to 10 lb. per cu. ft. and vermiculite concrete weighs 25 to 50 lb. per cu. ft.

Each of the six sections is accompanied by an outline map of the United States showing locations of principal sources of the different aggregates, as well as processing plants. For a matter of reference, the report also carries in tabular form weights per cubic foot of gravel, sand, crushed stone, and crushed basic slag.

Midwestern Ready-Mix Meeting

THE SEVENTH ANNUAL CONVENTION of the Wabash Valley Ready-Mixed Concrete Association held at the Stevens Hotel, Chicago, April 21 and 22, was well-attended and had a well-rounded program. Principal topics considered were the design of concrete mixtures, federal legislation, merchandising, the outlook for highways, and trends in plant design and equipment. The annual banquet was the only social affair, at which George E. Saas gave a talk, "The 13th Doughnut," and the "Ready Mixed Four" provided the entertainment.

Economical Concrete Mixtures

President Charles P. O'Leary presided for the opening session which was largely devoted to a talk, "Selection of Economical Mixtures to Meet Ready Mixed Concrete Specifications" by Stanton Walker, director of engineering, National Ready Mixed Concrete Association. Mr. Walker's talk was largely on fundamentals but on those which are often disregarded or not given proper emphasis. A major source of error, he said, is the casual attention given to yield in designing concrete mixes. Slight errors in controlling the weights in proportioning can contribute greatly to high costs.

Mr. Walker called attention to the effect of variations of moisture in the sand, that a variation of a percent or two could amount to 30 lb. of sand and 0.15 cu. ft. of concrete. Even in coarse aggregate, a percent variation in moisture could amount to 20 or 25 lb. of material and, say, .02 cu. ft. of concrete. Since these factors have such an effect on yield, Mr. Walker said that a day-by-day check might prove desirable for some operations. The industry should accumulate more knowledge of specific gravities, entrained air, etc., in order to be able to accurately proportion mixes by volumetric methods.

Another point brought out in his discussion of yield was that two or three percent of air entrainment is often being obtained with the use of regular portland cement. He suggested that producers determine the weight per cu. ft. of concrete by the simple process of weighing a batch or cu. ft. of concrete.

Mr. Walker had in mind customer relations when he suggested attention be given to discrepancies in volume of concrete at the plant and in the customer's forms. Shortages might be claimed due to inaccuracies of forms, and he pointed out that the customer should understand that the volume of fresh concrete will be something like 1½ percent more than that for dry concrete.

Another point made was that all air entrained does not stay in the concrete, as a result of handling. The volume of air might drop decrease as much as two percent in the bottom of

a lift due to pressure from above which cannot be controlled. However, he recommended that handling methods be standardized.

In producing strength concrete several fundamental principles were outlined to be followed. The importance of water-cement ratio must be considered and the effect of water content on the quantity of cement and the consistency of concrete. Use of the largest practicable aggregate together with the least amount of water will save on cement and the lowest possible consistency is also desirable in order to reduce cement and water. Use of the lowest possible ratio of sand to coarse aggregate is also recommended in order to help arrive at the lowest possible amount of water.

Mr. Walker pointed out that the use of air-entrainment presents some new problems that have a bearing on the general theories. Air entrainment does not increase yield, he said, but yield is a function of the design of mix. Air is an extra ingredient to be considered in mix design.

Mr. Walker briefly mentioned the new research headquarters for his association at the University of Maryland and the expanded research program to be undertaken particularly in the study of durability.

In response to a question as to whether crushed stone or gravel is the better aggregate, Mr. Walker said that gravel has some advantages but that crushed stone also does. He discussed briefly the effect of rounded particles in attaining workability, mineral compositions and their effects, etc.

Merchandising

R. C. Collins, general sales manager, Warner Co., Philadelphia, Penn., in a talk "Merchandising Ready Mixed Concrete," reviewed fundamental principles that apply in all markets. He cited the many advantages of ready-mixed concrete, among them quality and uniformity, speed in pouring especially in congested areas, assurance to the contractor in advance of his costs, the extension of the winter construction season and the greater spread of the employment season for contractors as a result, reduced job costs, etc., as the basic tools for selling the product on its merits. He reminded that the industry has a premium product to sell, that is perishable and which commands a premium price over job-mixed concrete by virtue of all its advantages. In selling, he emphasized that quality be stressed.

The next few years, in Mr. Collins' opinion, will present a real challenge to salesmanship and the industry must go to work in order to keep up sales and at prices that the product justifies.

Discussion developed around differences in cement prices as they affect

competition among ready-mixed concrete producers, advertising, the development of farm markets and winter-time pouring of concrete. Insofar as winter operations are concerned, some suggestions were to the effect that contracts limit the time during which fresh concrete may be poured, and specify conditions for mixing and handling. The standard sales contracts as drawn up by the National Ready Mixed Concrete Association stipulate that the responsibility of the producer ends when the concrete is discharged from the delivery truck. One producer said that he increased the price by 50¢ per cu. yd. for "winter concrete" to compensate for heating, inefficiency, freezing of aggregates bin gates, etc.

Mr. Collins, in answer to a question about developing farm business, advocated advertising in county papers and the use of mats prepared by the Portland Cement Association. F. E. Schowreiler, Fort Wayne, Ind., told of sending out letters addressed to 5000 farmers mentioning the availability of P.C.A. booklets and asking that cards be sent in by those interested in receiving the literature. A number replied and volume of farm business has been greatly increased.

Legislation

An entire afternoon was devoted to a discussion, "Federal Legislation and its Effect on American Business in 1949," by V. P. Ahearn, executive secretary, National Ready Mixed Concrete Association. Mr. Ahearn commented particularly on the Wage and Hour Law, Taft-Hartley Law and basing points.

In discussing changes to the Wage and Hour Law, Mr. Ahearn touched upon the interpretations he gave at the National Ready Mixed Concrete Association in New York. The administrator still holds to his opinion that companies may be liable to the law even though their products do not cross state lines, if they are contributory to interstate commerce such as being used for road-building, etc., although no court has yet upheld this interpretation. An administration bill sent to Congress would clarify the activities affecting interstate commerce and would seem to support the ready-mixed concrete industry's position. No change has been proposed to the 40-hr. work week regulations with provisions for time-and-one-half for hours worked in excess of 40.

Elaborate proposals have been made for the determination of the meaning of minimum wages, and Mr. Ahearn warned, as he has done many times before, that the beginning of the payroll week on Monday is the safe course to follow in order to avoid payment of overtime on overtime wages. The law is likely not to be changed, in his opinion.

(Continued on next page)

Mr. Ahearn does not believe that President Truman really wanted to repeal the Taft-Hartley Law but that his stand worked well as an election campaign slogan. The bill proposed by the administration would retain some of the Taft-Hartley Law provisions. Actually, the way it worked out, Mr. Truman asked for a law tougher than the Taft-Hartley Law, insofar as jurisdictional disputes are concerned. Mr. Ahearn said he would rather have strikes in a free society rather than compulsory arbitration. He touched on various suggested changes, much of which has already been published. If the president be successful, it would constitute a great victory for the CIO and make the A. F. of L. very unhappy, in Mr. Ahearn's opinion.

Mr. Ahearn gave some predictions as to the outcome in Congress, which will probably be decided to some degree before this issue is off the press.

Basing Points

The basing point decision has proven disastrous to some ready-mixed concrete producers. The industry must have a common cement price in order for its individual companies to be competitive and the effect will prove more serious as competition grows more intense, in Mr. Ahearn's opinion.

The Johnson-Capehart Bill up for consideration now has as one of its provisions that uniform prices or absorption of freight cannot necessarily be regarded as conspiracy and defines price as that paid for a commodity by the buyer. Mr. Ahearn doubts if this bill will pass in this Congress but he believes the Myers Bill may be enacted, which would provide a moratorium period of two years or less.

Mr. Ahearn said that the Myers bill would not legalize pricing methods but would affect pending cases up for decision. He suggested that the ready-mixed concrete industry not change its pricing practices now because of the ruling in the cement case.

In conclusion, he warned that labor unions will use the Taft-Hartley Law for political purposes. Those Congressmen opposed to the law will be vigorously opposed. It was urged that industry members tell their story to their congressmen.

State Highway Outlook

Samuel C. Hadden, Chairman, state highway commission, Indiana, discussed very frankly the problems of his job. It is chiefly one of re-selling the taxpayers on putting up enough money to do the job of rebuilding the state system of paved highways, that must be done within the next few years. He said there were so many new and extraordinary demands for state funds for other purposes, that it has become a difficult problem to prevent use of highway funds for every purpose under the sun, to say nothing of obtaining new money.

Added to the state's problem is the fact that new pavements cost twice to three times as much as those that

must be replaced. Corresponding revenues from gasoline taxes and automobile license fees have not appreciably increased. Moreover, the general public seems sour on highway engineers and builders because the original pavements have disintegrated much faster than anticipated. Increasing motor-truck wheel loads have been the biggest factor in the destruction of pavements, and the state is now battling with commercial truckers in an attempt to cut down excessive wheel or axle loads.

Mr. Hadden did not hold out much prospect of a large new highway construction program this year. The previous state administration let contracts last year to use up practically all available funds. With all the various pressure groups working on the legislature for public funds for this and that, the long-range highway construction outlook is not bright unless those interested in seeing the work done also get busy and assert themselves in somewhat similar pressure-group fashion.

C. M. Hathaway, chief engineer, state highway department, Illinois, has much the same story. He said we need a great deal of optimism to see where the money is coming from to do the rebuilding job that must be done. Even with the sizable fund available, lettings this year will be so late that the construction program will be far short of adequate. He said wheel and axle loads of trucks must be restricted. During the war no attempt was made to enforce the law, and the results were disastrous to pavements never designed to carry such loads.

The construction and the materials engineers, Messrs. Russell and Tittle, Mr. Hathaway's assistants, supplemented his remarks with special reference to construction methods and materials. It was brought out that a special attempt will be made to secure better graded aggregates — particularly sand, which probably will be required to be furnished in two sizes. There is a growing demand, they said, for ready-mixed concrete in state highway work, especially for patching old pavements, for culverts, bridges, etc. Some 300,000 sq. yd. of concrete pavement patching and widening was done with ready-mixed concrete in 1948.

Stanton Walker, director of engineering, National Ready Mixed Concrete Association, raised the question of what would become of some of the very large ready-mixed trucks now in use, which in some instances exceed the legal axle limits of Indiana and Illinois. Neither Mr. Hadden or Mr. Hathaway held out much encouragement that legal axle loads could be permitted in any case without serious damage to highway pavements as now designed. They suggested that truck manufacturers and ready-mixed operators get together to design vehicles that would meet legal limits.

A. C. Miller, manager, paving department, construction machinery division, Chain Belt Co., presented a

paper reviewing the history of the ready-mixed concrete industry, reciting the development from the time that dump trucks were first employed to transport central-mixed concrete. Since the advent of the rotating mixer and agitator, most of the development, he said, had been toward stronger, better and lighter construction and to obtain correct load distribution on the chassis. He said manufacturers were anticipating further limitations on axle loads, and would be governed accordingly, since all must recognize that pavements must not be overloaded. He thought that recommendations of the American Association of State Highway Officials would soon become generally adopted (18,000 lb. axle loads).

A great deal of the most recent development in equipment for the ready-mixed concrete industry, he said, has been in central mixing and batching plants. In general, he looked for no radical changes or improvements in machinery and equipment, but continued steady development in refinements and standardization. He emphasized that the operators of the equipment must continue a source of new ideas looking toward longer life and greater efficiency in the equipment they use.

W. Wayne Wallace, district engineer, Portland Cement Association, read a paper on the general subject of promotion of concrete for all kinds of construction. He emphasized the long-range angle; how promotion must start at the grass roots and follow through persistently and patiently, often consuming years of effort.

Prof. R. E. Huchins, Rose Polytechnic Institute, described a course for concrete plant men conducted under the auspices of the association in Indianapolis last December. The educational effort was confined to instruction on how to determine the moisture in aggregates, so that the water content and slump could be kept constant within narrow limits. It was voted to continue these annual concrete schools, not only for instruction in specific details, but because of the opportunity they afforded the plant men to exchange ideas.

Officers Elected

The following officers were elected for the ensuing year: president, P. Walter Acheson, Urbana, Ill.; vice-president, J. H. Rudolph, Evansville, Ind.; and secretary-treasurer, E. S. Horne, Indianapolis, Ind. New directors were elected as follows: C. S. Ward, Mt. Vernon, Ill.; L. L. Shidler, Kankakee, Ill.; C. C. Deal, Elkhart, Ind.; James F. McCracken, Louisville, Ky.; F. N. Bunzendahl, Connersville, Ind.

BAIDGER COLOCRETE CO. has been incorporated in Milwaukee, Wis., with 100 shares, no par value, and a minimum capital of \$3000. Betty Jane Werner, Mathew Horwitz and S. I. Wiviott are the principals.

Burned Culm For Lightweight Aggregate

C. & S. Concrete Products Co., Dalton, Ga., supplying large volume of block for housing to serve new industrial area

DALTON, GA., is a relatively small community located near the north boundary line of Georgia on highway No. 41 between Chattanooga, Tenn., and Atlanta, Ga. But although Dalton is a small community, it is within shipping distance of large industrial and housing expansions; and housing projects in the area are expected to absorb over 2,000,000 modular block every three months.

For a considerable time, the concrete block business was distributed among two groups; a relatively large group numerically but with a very small daily output, and the second group made up of the large producers with outputs in the 5000 (or better) units per day. There did not seem to be any middle group where plants were efficiently operated and produced in the 2000 to 3000-block range. Large cities can and do support a great number of concrete block manufacturing plants of both the large and the small type. As the smaller towns can't support a large plant, we find many small plants, many using hand machines, in these localities. But with the great growth in the use of concrete masonry, the medium sized towns are beginning to feel the need of nearby producers that can make a quality block in modest amounts, say 2500 units per day.

The C and S Concrete Products Co. may be placed in the latter grouping. This company is producing around 2500 to 2800 block per day. Mr. Swift is sole owner and takes care of all the company's office and sales activities as well as overseeing the manufacturing end—no heavy sales expense, no top heavy overhead. In fact he is "the works." You have to visit with him between multitudes of telephone calls for practically all his

sales are by phone. He says it took him over a year to really get the business established on a reasonably sound basis.

There are no frills around the plant or useless equipment. His No. 7 Joltcrete with skip from mixer to hopper over the Joltcrete is the heart of his plant. Six low pressure steam kilns of sufficient size are available to handle this production. The kilns have a canvas drop for the doors and steam is supplied by a 25-hp. coal-fired boiler. The cured block are transported to and from the kiln by hand trucks.

Use Burned "Culm" for Lightweight Aggregate

For aggregates, the plant uses sand and gravel, slag, cinder, and a material called "Dayco Red." This latter material comes from Dayton, Tenn. In that area are several coal mines that have large accumulations of coal mine waste or the so called "culm." This material caught fire spontaneously and burned for a considerable time. The result of this burning is a clinker, red in color, that shades into yellows and browns. When crushed it makes a very nice looking lightweight aggregate. The material was processed by the Dayton Coal Mines Co. of Dayton, Tenn., but recently the operation was taken over by Lambert Bros., Knoxville, Tenn., who use the plant almost exclusively for the production of crushed stone. The amount of the burned culm left in this pile is very small so unless some new culm piles start burning this phase of the business will end. However, it does indicate a possible use for culm in areas where coal is mined and where lightweight aggregates are scarce. A similar product is now being produced by Fireproof Aggregate Co., Lake City, Tenn.

Incidentally, in this same area the B. Miffin Hood Co., at Daisy, Tenn., operates a large brick and clay tile products plant. Rejects from their tile plant are crushed and used as a red-colored concrete aggregate for block manufacture.

The C and S Concrete Products Co. receive aggregates in hopper-bottomed railroad cars which are spotted on a siding along side the plant. A Farquhar unloader is used very effectively for handling the various aggregates. It is a conveyor with one leg built very close to the ground so that all that is necessary is to shove that leg under the hoppers section of the car and turn on the power and start unloading. A car is unloaded at a cost of about \$2.50 where formerly it cost in excess of \$20 per car. The aggregate



Plant and storage yard of C & S Concrete Products Co., located near main Chattanooga, Tenn., Atlanta, Ga., highway. Note portable car-unloader, extreme left

is unloaded to separate ground storage piles that parallel the track yet close to the plant for all the aggregates are hand-wheeled to the mixer at present. Sacked cement is used. The plant started operating in July, 1946.

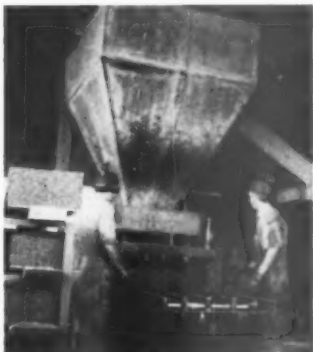
The area around Dalton, Ga., is to a considerable degree agricultural and deliveries are made into the rural areas. A new GMC semi-trailer job that handles 1100 of the standard hard aggregate blocks per load is used for deliveries, plus a 2½-ton Reo flat bed truck.

Small Order Service

CONCRETE, INC., St. Louis, Mo., has set up a service whereby small quantities of cement, aggregate, sand, gravel and accessory tools may be purchased by homeowner customers. The small order service is carried out in a new retail store at the front of the company's yard building, and the general lineup of merchandise is similar to a hardware store. Cement may be ordered in any quantity from 20 lbs. up, while sand, gravel and other materials are available in 50 and 100 lb. sacks. The company also has erected a new all-reinforced concrete office building at the front of the company yard with executive offices, director's room, and other offices.

Accept Block Testing Program

CONCRETE MASONRY MANUFACTURERS ASSOCIATION of Southern California has announced that 49 City and County Building Departments have given the Association written acceptances of the members' quarterly block testing program which guarantees to the Building Departments and the public that the members of this association are making quality block.



Block machine with large feed hopper in 2800 modular block per day capacity plant

Diversify Concrete Products Operation

Pipe, pumice block and ready-mixed concrete are complete line of Utah-Idaho Concrete Pipe Co.

DIVERSITY in its operations has been carried out by the Utah-Idaho Concrete Pipe Co., with plants and distribution yards in Ogden, Salt Lake City, and Provo, Utah; Nampa and Caldwell, Idaho. In addition to manufacturing concrete pipe in large volume, this company produces ready mixed concrete and concrete pumice block. No pipe is made at its newest Caldwell plant; only ready mixed concrete, however, stocks of pipe and building block are carried there. The company manufactures pumice building block at its Ogden and Provo plants. Pumice is also stripped and prepared at the Idaho Falls operation, and supplied to other manufacturers such as the Cinder Products Co. of Jerome, Idaho.

Block Haulage

There would be nothing particularly interesting about this but for the fact that Jerome, Idaho, is in the south central part of the state and just north of Twin Falls, Idaho. To get the block into Caldwell, the trucks must go through Boise, making a one-way haul of about 175 miles. To get block from the Ogden yard, the fleet of four Kenworth trucks with Trailermobile trailers must make a one-way haul of close to 375 miles or roughly the width of the State of Idaho. This would be comparable with making blocks in Pittsburgh, Penn., and hauling them to Harrisburg to the east, and to Columbus, Ohio, to the west. To make this haul, the 10-wheel semi-trailers will haul up to 2500 of the 8- x 8- x 16-in. block per load. This pumice block weighs about 23 lb., making the total pay load 28.7 tons. Traffic density on the highways is relatively light, and the roadbeds are excellent so that once in the open these trucks wheel along at 60 m.p.h. The trucks at Jerome are loaded with the aid of forked lift trucks and are unloaded by hand at the various yards. The truck shown in one of the illustrations had a load of 1600 block, and it required over an hour for two men to unload it.

Another interesting feature relating to these pumice block is that the buyer is given an Underwriter's certificate, and due to the high insulating value of the pumice block the builder



Ready-mixed concrete plant of Utah-Idaho Concrete Pipe Co. Sacked cement is dumped to the elevator boot, lower left

can get as much as a 40 per cent fire insurance reduction through the use of this certificate.

The Utah-Idaho Concrete Pipe Co. has its own sand and gravel plant near Caldwell, Idaho, where washed and sized aggregates are prepared. At Caldwell this company recently erected a Heltzel batching plant equipped with Howe scales, and two Smith 4-cu. yd. mixer trucks have been assigned to this plant. The company also installs irrigation and drainage pipe. George R. Jessen is president and general manager with general offices in Salt Lake City, Utah. Wallace S. Moore is manager of Idaho operations and Larry Cook is superintendent located at the main Idaho office in Nampa.



One of fleet of four similar tractor, semi-trailer trucks that haul up to 2500 8-in. equivalent block per trip. One way haul is often as great as 375 miles

Concrete Additives

IN A REPORT appearing in *Highway Research Abstracts*, Oct., 1948, concerning use of waterproofing and other additives in German concrete, it is brought out that one material is a mixture of 6-percent fatty acid (olein), 20- to 30-percent potassium silicate, and water, and is used in the proportion of one part of solution to 20 parts of mixing water. It is claimed that the addition of this solution to concrete does not affect its shrinkage, but reduces its strength by about 10 percent. The additive is said to produce calcium soap in the pores of the concrete.

Another solution to be used as an additive and comprised of 2 lb. of calcium chloride and 2 lb. of sodium nitrate per gal. of water is claimed to prevent corrosion of steel reinforcement. Hydrated lime, used as an additive in concrete road construction to improve workability, is no longer used because it delayed setting-time of the concrete.

A cement made with the addition of three percent of bitumen to the clinker was used in concrete roads because of its waterproofing properties, but its use was abandoned because it caused the mixing water to separate and rise to the top of the slab. Bitumen has been used to coat a portion of the aggregate before mixing, but no information was obtained on the results. No attempt had been made to add bituminous emulsion to the gauging water.

One cement manufacturer was making rapid-hardening cement by adding two percent calcium chloride to ordinary portland cement.

NEW MACHINERY

Bag Flattener

THE FLEXOVEYOR MANUFACTURING Co., Denver, Colo., has developed the Flexoveyor Piler and Bag Flattener,

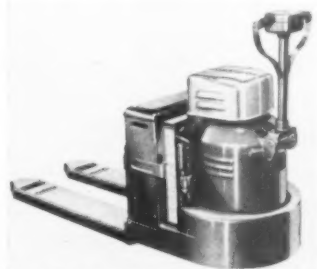


Unit designed to flatten and elevate bags in one operation

designed to flatten and elevate bags in one operation. The unit, available in sizes to elevate from 12 to 20 ft., is completely portable, and is available with power-driven mechanism for self-propulsion. As a bag is conveyed through the unit, kneading and pressing actions of the top hugger boom eliminate air from it, producing a smooth, well-shaped, easily-handled bag, the manufacturer states.

Battery-Powered Hand Pallet Truck

TOWMOTOR CORP., Cleveland, Ohio, is producing a battery-powered hand pallet truck said to be easily maneuvered in close quarters and have a high safety factor even under maximum loads. Featured are rapid lifting of loads, high traction, maximum power, safety handle with control buttons for either right or left hand operation, 3-point suspension for smooth travel over uneven surfaces, and differ-



Battery powered hand pallet truck

ential-action trailer wheels for easy turning. Safety features include an automatic power cut off upon release of the control handle.

Loader Attachment for Concrete Mixer

KWIK-MIX Co., Port Washington, Wis., has developed a tower loader attachment for its Models 11-S and 16-S mixers which discharges concrete batches to forms above ground level or into trucks. Maximum discharge height is 9 ft., 2 in. The bucket is said to handle a full batch directly from the discharge chute of the portable concrete mixer. Discharge at the top of the tower is completely automatic. Bucket travel and discharge is completed during the time the following batch is being mixed in the mixer drum.

Operated by a hoist, the load is controlled by a single lever located on the operator's platform. The hoist is mounted within the mixer frame and is powered by the mixer motor. Hoist

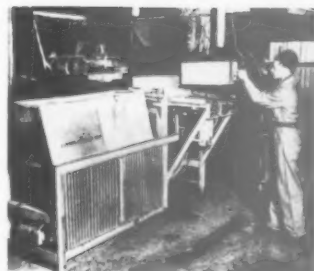


Loader attachment discharges concrete batches to forms above ground level

clutch is disengaged automatically when the bucket reaches discharge height. For job-to-job movements, the tower can be collapsed and positioned for road clearance, or may be moved on a job location without collapsing.

Block Handling System

KENT MACHINE Co., Cuyahoga Falls, Ohio, is manufacturing the Kent Blockmatic Robot Handling System for transfer of cured block to storage and the cleaning and returning of pallets to the feed magazine of the block machine. Each system is comprised of a varying number of component machines depending upon the installation. The basic machines are two air-operated hoists or offbearers, one or more roller conveyors, a master handling unit and one or more secondary handling units. The master handling unit is a composite of a motorized, synchronized block push-off arm with pallet cleaner; a chain driven block machine magazine



Operator with air-operated offbearer takes a loaded pallet from the rack and places it in a position on the master unit. Pallet contact with switch starts the cycle

charger which returns the cleaned empty pallets to the magazine of the block machine; and some of the manual and automatic control switches of the system. Secondary handling units are comprised of a single motorized, synchronized push-off arm and a transfer table across which this arm moves when causing a change of direction in block travel and returns to await another cycle. Cubing is done manually with another patented off-bearer. A cycle description of the system is given in the March, 1949, issue of ROCK PRODUCTS, page 140, under the heading "Noble Award."

Half-Ton Lift Truck

BARRETT-CRAVEN'S Co., Chicago, Ill., has resumed production of the "HT" lift truck. The truck, designed to handle loads up to 1000 lb., is of welded construction throughout, and is made with lowered heights of 3½, 6, 7 and 9 in., and with carrying frame lengths of 36 and 48 in.

To operate the unit, a bar handle is pulled down and the load is elevated. A full 2-in. lift is provided. The truck has a width of 18 in.

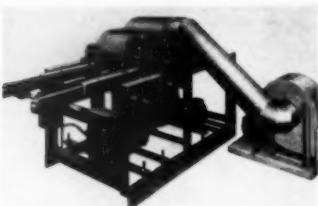


Half-ton lift truck

NEW MACHINERY

Pallet-Cleaning Machine

BERGEN MACHINE & TOOL CO., Nutley, N. J., has developed a new pallet cleaning machine which comes equipped with a dust removal system. Pal-



Pallet-cleaning unit with dust collector

lets to be cleaned are placed, one at a time, on the machine's conveyor chain, and come off at the other end clean in one pass and ready for placement on an empty rack for transporting to the magazine of the block machine.

The cleaning mechanism consists of three shafts revolving on ball-bearing pillow blocks, the first shaft carrying a set of hammers. On each of the other two shafts four sets of flanges are mounted, each of which is drilled to accommodate six star-holding shafts. Nineteen pack-hardened steel cleaning stars are carried on each of these star-holding shafts and are punched with holes considerably larger than the shafts on which they are mounted. The pallet passes under the two cleaning shafts, and the stars, when rotating, are thrown outward by centrifugal force, striking the pallets and removing any concrete adhesions.

Other features listed by the manufacturer are framework of welded, extra-heavy angle iron; two motors of 5 and 10 hp. respectively; a chain mounted with pallet-moving lug links, each with a hard, silver-soldered insert to reduce wear; and the entire unit can be picked up and moved by a fork-type lift truck without danger of damage. At normal operating speed the machine is said to clean an 18½ x 26-in. pallet in 12 seconds, or a 12 x 18-in. pallet in six seconds.

Mixer Chassis

AVAILABLE TRUCK CO., Chicago, Ill., is in production on a new line of mixer chassis, designed specifically for truck mixers and agitators. The line is comprised of four models, one for each size mixer, and each model features cab-over-engine design which is said to provide minimum turning radius, correct weight distribution and better driver vision. Other features of the line listed by the manufacturer are: exceptional tractive effort to assure ready-mix operators that the charge will be delivered to the remotest forms; heavy duty construction; ample high-

way speed; and wheelbases providing for a minimum of 18 in. between back of cab and mixer for easy access to the auxiliary engine on the mixer.

Concrete Mixer

T. L. SMITH CO., Milwaukee, Wis., has designed and built a new 6-cu. yd. Tilter which is said to be the world's largest concrete mixer. The new unit provides 50 percent greater output, with practically the same labor, power and general overhead costs, and will mix 6 cu. yd. per batch, in addition to its 10 percent overload guarantee, the manufacturer claims. One batch fills a 4½-cu. yd. truck mixer (6½-cu. yd. agitator). Other features listed include: auto-

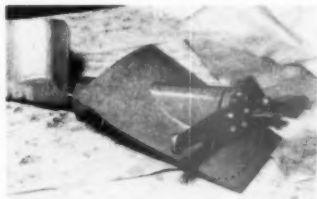


Six-cu. yd. concrete mixer with "tilt and pour" discharge

matic feed chute charging, "tilt and pour" discharge without segregation, complete control of discharge, all-welded support pedestals and tilting frame, 10-hp. electric motor direct-connected to transmission by a splined shaft double universal joint, and push button or manual controls.

Measure Consistency of Concrete During Mixing

GLENWAY MAXON, Milwaukee, Wis., has announced the Plastograph, a tool to measure the consistency of concrete while the concrete is being mixed. The method is based on the fact that



Plastograph before installation in mixer

high slump concrete flows easier than low slump concrete. The inside of a Smith type of tilting concrete mixer may be compared to a rotating curved chute, formed by two cones and a center cylindrical section, Mr. Maxon states. Blades are set in at angles on this curved chute to interrupt the flow of concrete. These blades mix the concrete. The drum and the blades rotate during mixing at constant speed in one direction. The concrete flows intermittently in the opposite direction down the curved chute and through a gap between the mixing blades. The mixing blades are like the walls of a converging flume and narrow the stream of concrete. At the termination of the blades, the concrete rushes through and spreads out, impinging on a reaction bucket. This bucket is mounted on a pivotable shaft parallel to the axis of the mixer. Concrete impinging on the bucket rotates the shaft a few degrees, in turn rotating an external wiper into the path of a series of electrical contactors

(Continued on page 175)



Mixer chassis for truck mixers and agitators

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January 12, 1949

Mr. C. H. Grant,
President,
C. H. Grant Company,
435 Bryant Street,
San Francisco 7, California.

Dear Mr. Grant:

Regarding the Blaw-Knox 4½-yard Truck Mixers, we are getting very good performance from them.

They are easy to keep clean and will be free from tailgate trouble, which are the major maintenance problems with other mixers.

We find that they load faster and will discharge low slump concrete faster than any of the other mixers that we own.

Sincerely,
A. TEICHERT & SON, INC.

C. A. Williamson
C. A. Williamson
Superintendent

CAW:ar

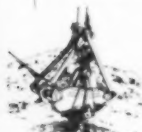
"THEY LOAD
FASTER AND DISCHARGE LOW
SLUMP CONCRETE FASTER
THAN ANY OTHER MIXER"

Says C. A. WILLIAMSON
A. TEICHERT & SON, INC.
Sacramento, Cal.



BLAW-KNOX *Hi-Boy* TRUKMIXERS

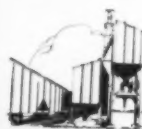
READY-MIX OPERATORS all over the country keep telling us "We like Hi-Boy Trukmixers"! And to prove their preference for the unit that speeds production and slashes costs, *more and more* operators are buying Hi-Boys. They like the revolutionary new Revolving Hopper that permits faster charging, faster discharge, with minimum seal maintenance. They like the thorough, uniform mix, the wide, spiral blade arrangement that discharges *all* the concrete in the drum without segregation and the consistently low maintenance. Above all, they like the trouble-free, high yardage production, shift after shift, day after day! For complete details about *all* the profit-producing features, write for Bulletin 2223.



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called probes. Stops on the arm, external of the mixing drum, limit the amount of rotation. The angles of the "chute" to the horizontal in the cycle of rotation, and the position of the reaction bucket at the time plastic concrete strikes the bucket, are functions of the degree of plasticity of the concrete. Water added while mixing will advance the instant of impact.

Each one of the probes is insulated from the mixer, and can be adjusted radially and about the circumference, those adjustments being provided so as to conform either to slump tests or degree of workability of the concrete mix. The circuits from the probes are of extremely low voltage and are amplified through an electronic relay box. Plug in connections from this box carry 110 volts to an indicator box, consisting of an operating signal light and 8 consistency lights. An operation recorder charts the consistency of the concrete being mixed, at each revolution of the mixer. Each contact or probe is recorded individually on the chart.

The plastograph before installation in the mixer is shown in the illustration. The reaction bucket is to the left, attached to the shaft which rotates on anti-friction bearings in the barrel. The barrel shown penetrates the shell of the mixer through a hole which is first located in the proper place in respect to the blades of the mixer and then flame cut. The conical shield, welded to the barrel, is then welded to the shell of the mixer, closing the orifice. The parts external of the mixer drum are shown to the right. The extremity of the arm which is keyed to the shaft mounts a wiper shoe which

makes contact with the probes whenever concrete impinges on the reaction bucket.

Horizontal Drain Tile Machine

WAGONER MANUFACTURING CO., Gibsonville, N. C., has developed the horizontal No. 1-A combination drain tile, turpentine cup and flower pot machine which can produce 4-, 5- and 6-in drain tile, 12 in. long; straight and slanting turpentine cups; and a variety of sizes of concrete flower pots. The change to each type of manufacture is said to require only a few minutes and necessitates replacing only packer head and mould support plates.

Drain tile capacity is 1000 to 3000 per day. By making the tile in a horizontal position, the plunger forces the material against the packer head making a denser, harder tile than a gravity feed will, the manufacturer states. The packer head is made with a base and 2 to 3 case hardened pins which, when worn on the outer side, can be turned 6 times to a new wearing surface. Forms for drain tile are made with two handles which lock when the tile is removed and the form closed.

The machine, requiring 16- x 60-in. floor space, is of steel construction, with shafts running in sealed ball bearings. The drive pulley has bronze bushing and removable keys, and three different sizes are furnished with the unit. Power is supplied with an electric motor with V-belt drive. The forms for cups and pots are made of cast aluminum.



Combination drain tile, turpentine cup and flower pot machine

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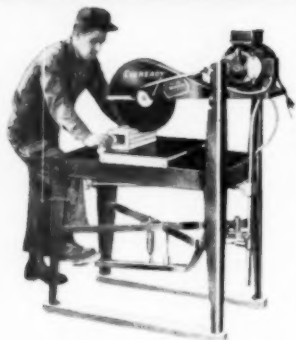
For nearly three decades we've been making concrete pipe on our own machines. That's how we've learned to build them for highest production with fewest man-hours . . . Universal machines feature phenomenal tamping action—680 strokes per minute—thus use a drier mix with resultant stronger pipe that handles easily from machine to curing room.

Universal supplies all accessory equipment, too: Mixers, Bending Rolls for plate or wire mesh, Wire Mesh Welders. Write for details.

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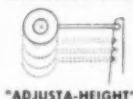
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SECONDS



TILE BRICK PIPE CONCRETE GLASS

Abrasive blades for dry or wet cutting. Diamond blades for wet cutting. A blade for ANY job.

EVEREADY slices through ANY material ANY SIZE in seconds . . . wet or dry. Can be bought equipped originally for drycutting. Later inexpensive wet cutting kit can be installed in a few minutes.

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Without obligation send information on EVEREADY BRIKSAW and blades for cutting . . .

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STATE

Washington Concrete Products Producers Meet

THE CONCRETE PRODUCTS ASSOCIATION OF WASHINGTON held its Annual Spring Meeting on March 12 in the Arctic Building, Seattle, with 39 concrete products manufacturers and guests in attendance. The morning session was devoted to routine business matters and committee reports which outlined the extensive use of concrete products fostered by such programs as research, education and advertising to aid architects and engineers.

R. M. Gilmore, safety consultant, spoke at the afternoon session on "Cost of State Industrial Insurance," covering facts and figures which emphasize the necessity for a working safety program in industry. He stressed six points necessary for a successful safety program: (1) Program must have the support of management; (2) Simple records to take the guess work out of accident experience and costs; (3) Know where hazards lie and regular inspection procedure; (4) Appoint a safety man with instructions to see that safety is practiced in the plant; (5) Protection from machines and processes along with control of health conditions; (6) Employees' personal education and knowledge on safety.

President G. P. Ducey presented the subject, "Different Methods of Manufacturing Concrete Pipe," commenting on the tamp, vibration, vacuum, packhead and centrifugal methods. He emphasized mechanical equipment, such as fork lifts and other handling equipment, as essentials for a modern manufacturing company.

J. J. Wegner, Washington State College, Division of Industrial Research, in his presentation of "The Pumice Research Program," gave results of thermal conductivity tests made on different pumice block in the state. This work is being carried on at the college laboratories, where tests on waterproofing paints for masonry walls also are being conducted. Over 40 paints are under study, most of which are the transparent type of coating.

J. A. Roberson, also of the college division of industrial research, reported the progress on the study of reduction of flow and water hammer in his talk "Irrigation Pipe Study." He explained the effect of longitudinal compressive stress and water hammer in the irrigation pipe lines.

Assistant to President

ROY DARDEN INDUSTRIES, INC., Atlanta, Ga., manufacturer of concrete block plant equipment, has announced the appointment of Elizabeth Copeland who will assist Roy Darden, president, in coordinating activities between the home office of Darden Industries and its subsidiary organizations. She also will have a part in the F & A floor and roof system promotional program.



Miss Elizabeth Copeland

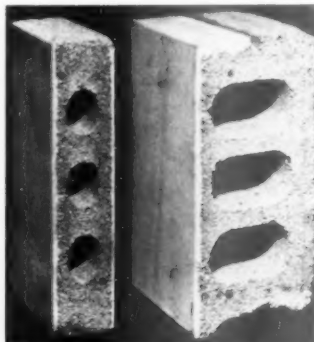
Miss Copeland, who was formerly with Besser Manufacturing Co. in Atlanta, has studied industrial engineering, business management, and salesmanship. She also has worked in the capacity of office manager, president of an advertising company, administrative assistant in industrial development, industrial engineer, and methods analyst. Assisted by the National Safety Council, she established the present system of driver licensing in the Georgia State Department of Public Safety.

Marble-Faced Block

JAMES A. KNIGHTON, president, Knighton Franchise Distributing Co., Birmingham, Ala., has patented a waterproof, stone-faced concrete block which is said to eliminate the cost of labor and material in the waterproofing necessary for regular concrete block. In the laboratory, Knighton block test at less than one percent water absorption, although block testing at approximately 8 percent are considered waterproof by most laboratories, according to the company.

In another test, block were heated for 48 hr. at 500 deg. F. and im-

(Continued on page 178)



Marble-faced block facing was applied during the process of manufacture of the block

Different... Sensational... WORK THE FIRST DAY AND THEREAFTER

\$4300.00! HOW CAN SO LITTLE MONEY BUY SO MUCH!

400 BLOCKS
PER HOUR



VAN-U-MATIC has ALL the features . . . Pneumatic power operation, vibration and off-bearer . . . Plain pallets ($\frac{1}{3}$ usual pallet investment) . . . Makes all size blocks, 16" or 18" length . . . Quick, easy changeover . . . True dimensional, Perfect blocks . . . Compact, easy to install and clean . . . We can finance.

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- Faster discharge
- Faster handling by customer



CONCRETE CONTRACTORS

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- Shortened finishing time
- Reduces surface water
- Immediate finishing after placing
- Requires less troweling



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- Increased production
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Protex... fully approved under ASTM C-175-48T and Federal spec. 55C-192

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Please send me your book, "Facts on Modern Placement of Concrete Through Air Entrainment."

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- Increased production through placeability
- Decreased machinery wear through plasticity
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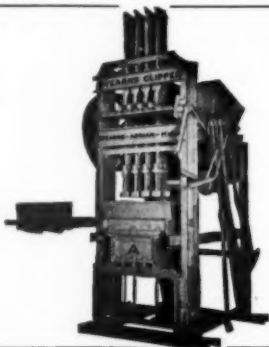
"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Stearns Clipper Stripper Machines, Stearns Joltcrete Machines; Stearns Mixers; cast Iron and Press Steel Pallets, Straublox Oscillating Attachments, etc.

Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

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mersed in water at 35 deg. F. on removal from the oven with no apparent effect. The units have a 3/8- to 1/2-in. stone or marble facing which is applied in the same operation in which the block is made so as to eliminate freezing off or damage by heat or water. The units eliminate the need for furring or use of stucco.

Edward S. Schulhof, president, Knighton Process Marble Face Block Licensing Corp. of New York, has announced that exclusive manufacturing and sales rights to service building requirements in the counties of Essex, Union, Middlesex, Morris, Monmouth and Somerset have been granted to the New Jersey Block Products Co., Kenilworth, N. J. The block also are being manufactured by a number of plants throughout the South.

Determining the Amount of Cement in Concrete

J. L. MURDOCK, M.Sc., Ph. D., A.M. Inst. C.E., describes a new method of determining the amount of cement in a sample of wet concrete in *Cement and Lime Manufacture*, September, 1948. The method is based on determination of the variation with time of the specific gravity of water containing fine material in suspension, and avoids the chemical analysis and evaporation of large quantities of water inherent in some other methods. If the aggregate contains no particles smaller than those passing a 100-mesh sieve, the method is as follows:

A sample of wet concrete weighing about 3 kg. is washed on B.S. sieves Nos. 14 and 100, the purpose of the coarser sieve which is used first, being to protect the No. 100 sieve from damage. The aggregate retained on the No. 100 sieve is dried and weighed, and a complete grading analysis is made. The cement which passes the No. 100 sieve is collected in a large metal cylinder and water is added to make up a known volume. A metal cylinder having a capacity of 19 litres when filled to 1/4 in. below the brim is recommended. After vigorously stirring with a wooden paddle for one minute, a hydrometer is inserted and readings are taken at 10-seconds' intervals for 1 1/2 to 2 min. The water containing the suspended material is again stirred and hydrometer readings again taken. This process is repeated until four series of readings have been obtained.

The hydrometer readings are then plotted against time and the curves are each extrapolated to zero on the time scale. The average value of the four curves at zero is calculated and the amount of cement is determined by reference to a control curve obtained by taking hydrometer readings of water in which are suspended known quantities of the same cement.

If the aggregates contain fines passing a No. 100 sieve, it is necessary to adopt one of two courses: (1) If

(Continued on page 180)

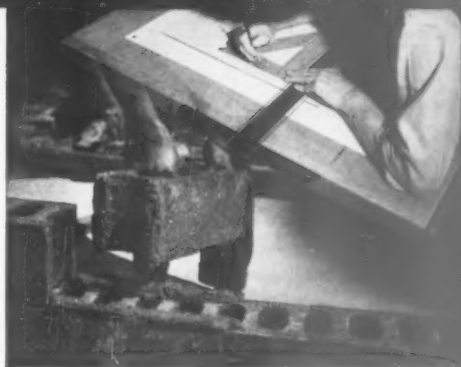
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QUALITY WALLS DEPEND UPON PROPER PLANNING

QUALITY concrete masonry construction requires thorough planning. That means careful consideration of these factors:

1. *Strength* to carry the expected load by using adequate footings, quality block, good mortar and concrete lintels over openings.
2. *Watertightness* by carefully compacting mortar, using concrete sills and lintels and applying portland cement paint or stucco to exterior walls.
3. *Expansion and contraction control joints* in the wall as well as between wall and floors.
4. *Nature of occupancy* and intended use of building.
5. *Building site conditions*: topographical, geographical and climatic.

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PROPER PLANNING—
THE FIFTH OF
6 IMPORTANT STEPS
IN QUALITY
CONCRETE
MASONRY
CONSTRUCTION



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Select from 8
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Hourly Output 4 Yards
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Write your own ticket for your plant's cinder-grinding requirements . . . one of the 8 AMERICAN Grinders will give you the output needed . . . deliver minus $\frac{3}{4}$ " mesh aggregate without additional separation! Your AMERICAN Grinder will require minimum maintenance . . . will conserve power . . . will help produce low-cost, top-quality cinder block. Write . . . wire . . . phone . . . ask for an AMERICAN grinding expert to help you lick your problem.

CAPACITIES . . . YDS. PER HOUR

No. 5 4	No. 9 30
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No. 7 12	No. 418 . . . 50
No. 8 20	No. 384 . . . 75

American GRINDERS by
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A BONUS EVERY PAYDAY to truck-man OWNERS!

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with 62" platform

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General Block Machine with wonderful new split type expansion Mold Box makes it easy to produce different design blocks. Changes to any width block from 4" to 16" in less than 20 minutes. A real money saver. The General more than pays for itself by saving your labor costs and last production in the time it takes to make three changeovers on your regular machine. Machine ruggedly constructed. Vibrator Shaft mounted in sealed ballbearings, produces up to 1000 8x8x16 blocks per 8-hr. day. Superior three Core Type meeting all Building Code requirements. Full Operating Instructions and Mixing Formula's with each machine. Immediate Delivery. Full Details sent Free without obligation.

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The easily dispersible, non-floating, permanent, qualities of these extra strong colors produce intense shades in concrete.

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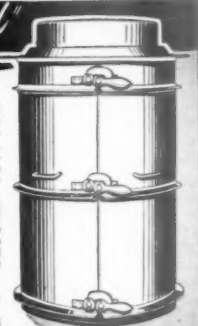
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The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the bands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formula combine to produce the finest concrete pipe at lowest cost.

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For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell and pipe at lowest cost.

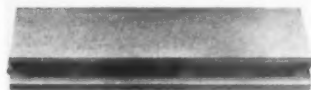
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SPRAY-O-BOND Co., Milwaukee, Wis., is offering a rust inhibitive pallet, rack and form solution, composed of water repellents, rust inhibitive, block agent and light volatile oils. It is said to prolong life of metallic objects subject to high humidity and moisture conditions, provide easier stripping of pallets and metal forms, and provide protection to wood forms by the repellents.

MARIETTA CONCRETE CORP., Marietta, Ohio, with plants at Baltimore, Md., and Charlotte, N. C., has announced production of a new air-cell concrete stave which, when used in the construction of farm silos and industrial storage bins, helps to eliminate freezing through air insulation. Developed after 13 years of research, the new stave is 4 in. thick as compared to the conventional 2½-in. thick



Concrete stave with five air cells for insulation



Conveyor trailer permits load of cubes of block to be deposited in one operation

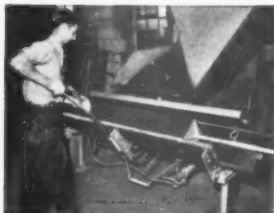
solid stave, and weighs about one-third less. Each stave has five air cells which provide the insulating qualities, and the stave can be tamped from all sides, with a great resulting density. Frank Christy, president of the company, further stated that the strength of the air-cell units, due to the truss-like construction, is from two to three times as great as ordinary staves.

ARTHUR REHBERGER & SON, INC., Newark, N. J., has designed the Tip-Top conveyor trailer for use by the concrete block industry. Built to overcome high unloading costs, the

trailer's action permits an entire load of 8 cubes of block (75 block to a cube) to be deposited in one operation, without damage to the block, the manufacturer states. Average time-saving is estimated at 1½-2 hr. per load. An additional cube of block can be carried on the deck of the trailer.

Block are loaded on the conveyor rollers, each block resting on two rollers. The load is controlled by three winch lines running from the forward part of the trailer frame and is regulated by a 16-in. disc brake. The platform frame is hydraulically controlled, as is the tailskid. A 20-ton model, accommodating 10 cubes of block on the trailer proper, plus one cube on the platform, also will be available soon.

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EXPAND your line—
your market—
your profits—
with the new
KENT Lintelator



Batch Mixers—
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CONCRETE PRODUCTS MACHINERY
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Block Makers agree—
for example:

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9808 HURDELL AVENUE
DETROIT 27, MICHIGAN

September 8, 1948

The Kent Machine Company
Cuyahoga Falls, Ohio

Dear Sirs:

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Yours very truly

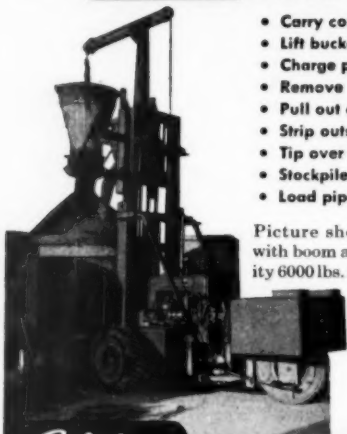
Cinder Block Inc.

W. H. Peck
Production Manager

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- Carry concrete bucket
- Lift bucket over form
- Charge pipe form
- Remove cone from form
- Pull out core
- Strip outside form
- Tip over finished pipe
- Stockpile pipe
- Load pipe on trailer

Picture shows Model F-6B with boom attachment, capacity 6000 lbs. Also F-10, capacity 10,000 lbs., and F-16, capacity 16,000 lbs.

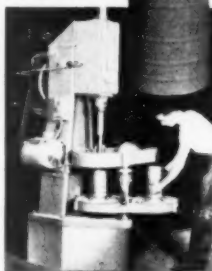
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3840 8X8X16 Blocks Per Day
At a Labor Cost
OF LESS THAN
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This machine is the plain pallet, vibrating, strip-type, with all the advantages of quiet operation, clean pallets, fast size changes.

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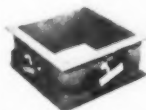
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Save your bins. Eliminate destructive pounding by installing CLEVELAND Type "F" pneumatic vibrators. These powerful units will prevent arching-over and plugging of sand, cement, and other granular or powdered materials in bins or hoppers with capacities from one to several hundred tons. And... they assure a steady flow of materials when production demands are the greatest.

TYPE "F"



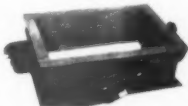
TYPE "5A-4"



Type "5A-4" units have been developed to convert one and two-block mold boxes from eccentric shaft to powerful piston-type vibration to give increased production of top quality block with a better finish. These dependable units are economical to install and operate.

For two and three block mold boxes, we recommend the heavy-duty CLEVELAND Type "J" vibrators, which are equipped with flat-surfaced angle-mount heads for easy and rapid attachment. They develop maximum vibration with minimum air consumption.

Knee or hand valves are available for use with all CLEVELAND vibrators.



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- For exterior or interior use on cinder blocks, light-weight aggregate and concrete blocks.
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- Easy mixing. No lumps. Quickly soluble.
- Easy brushing. Spreads like butter. Cures fast.
- Comes in white and seven beautiful shades of ivory, light buff, grey, cream, green, sunny yellow, brick red. Easy to blend for pastel shades.

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Model 4-CD: 3-4 1/2 Cu. Yds.*

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Thus, low-cost, easy-to-operate AIRCRETTERS, which meet all capacity requirements, put within reach of any operator the tremendous profit advantages resulting in the use of air entrained concrete.

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THESE EXCLUSIVE FEATURES ASSURE BETTER DELIVERY OF AIR ENTRAINED CONCRETE

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2. Self-supporting Rollaway chute.
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6. Full rounded body and gate.
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8. Automatically correlated gate and chute action.
9. 5-to-1 action Hi Pressure Gate.
10. Insulated body at bottom and lower sides.
11. Constant point of high discharge.
12. Heavy duty Aircrete Hoist.

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Get this series of articles on Air Entrained Concrete, Central Mixing Plant Operation and Delivery of Materials, written by Mr. J. A. Nicholson, an outstanding authority on concrete and president of the Nicholson Concrete Company, Toledo, Ohio. These articles present an honest analysis of the most discussed question in the concrete industry today—the pros and cons of air entrainment and the profit possibilities thereof.



Hercules

STEEL PRODUCTS CORP., GALION, OHIO

Fertilizer Spreaders • Semi-Trailer Bodies • Garbage Bodies
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POSITIONS VACANT (not display ads) \$1.00 a column inch an insertion. Terms: Cash with order except contract advertisers who are billed monthly.

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FOR SALE

Stearns Joltcrete No. 7 in excellent condition complete with automatic carriage, switches, \$550.00 worth of spare parts, four mould boxes, 28 cubic foot Stearns mixer equipped with 25 H.P. motor, and a 5000 pound Barret Craven hand lift truck, all for \$1,995.00. 900 12x8x16 Cast Iron pallets \$270.00.

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FOR SALE

One Johnson 600 cubic yard cap., 8 compartments; 36 ft. Box shaped mounted on 14" B-Beams, 67 ft. long; Batching Equipment, Water Batcher; Collectors, two, 2 yard Smith Mixer, Cement Elevator, about 300 ft. 34" Band Conveyor with under truck feed conveyor; Hot water equipment, Air compressors, Heating Plant, Office Equipment, a plant built about two years ago and on account of its location was condemned and only was in operation about a month. Sold on Court Order. The plant is complete and is for sale at less than one half of the cost. If you are contemplating building a ready mix plant it will pay you well to come and see this before buying.

HASS WHOLESALE, INC.

3922 W. Sample St., South Bend 21, Ind.
Telephone—3-9407

WANTED TO SELL: A Concrete Mixer

3 yd. Ransum mixer mounted on 1946 K-S International truck, both mixer and truck are in excellent condition, bought Dec., 1946. Reason for selling overstocked in mixers. Will sell reasonable.

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Altavista, Va.

HAVE YOU SEEN OUR NEW PALLET CLEANERS?

AN AUTOMATIC MACHINE FOR REMOVING CONCRETE "BUILD-UP" FROM PLAIN PALLETS. Cleans an 18"x26" Pallet in 12 seconds.

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Block Plant Business

- 1—25 K.W. Caterpillar Diesel generator \$1,800.00
- 1—25 cu. ft. paddle mixer with 15 H.P. motor \$1,300.00
- 2—No. 3 Flam block machines (Lift, platform, vibrator and stand) each \$ 700.00
- 1—No. 2 Flam block machine with lift and stand \$ 250.00
- About 1500 plain wooden pallets each \$.25
- 10 sets of dies for No. 2 machine ea. \$ 125.00
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(All block equip. used about 4 months.)

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East 3rd St. East Highlands, Calif.

BLOCK MACHINES FOR SALE

Six Clipper Strippers—\$1500.00 ea. All guaranteed to be in first class condition. Thousands of steel and cast-iron, cored pallets.

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FOR SALE

(2) 50 cu. ft. BESSER Batch Mixers. Purchased new in 1946. Both of these mixers have good motors. Priced low for quick sale.

Wm. M. CHASE

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YARD SURPLUS SALE:

Ransome 4-cu. yd. Mixer with Model OXB5 Hercules 3x1/4" Mixer Engine. Condition, Good. \$1500.00. Johnson 1-cu. yd. Concrete Buckets (2). Slightly Used. \$150.00 each. 2-cu. yd. Dumpster Be Body. Model 20. Condition, Good. \$750.00. 400 International Model K-6 Truck with Rex 2-cu. yd. Mixer. Model TB 132. Condition, Good. \$2500.00.

S. & G. CONCRETE COMPANY

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1947 Kelley Air Stripper block machines—mold boxes steel pallets from 4" to 12"—chimney block attachments—60 steel racks and shelves—priced to sell quick.

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Concrete Pipe Forms, Tongue and Groove 15" 18" 24" and 30" diameter 3 foot length.

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- Septic Tank forms, monolithic with cast 4" T's
- 3—540 gallon tank forms
- 1—735 gallon tank forms
- 1—Heidelberg low pressure boiler
- 1—Wooten 14-4 drain tile machine and mixer
- 1—Construction Machinery Co. 6-8 concrete mixer
- 1—G.M.C. 6x6 Army truck front wheel drive, tandem duals rear; cab and chassis or with 7x12 steel platform body and overhead trolley for handling septic tanks. Will sell any or all of above. All is in good condition and may be inspected any time.

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- 1—Lewis Shepard 6000 lb. hand platform lift truck for 90" Vibrapac rack. New condition (cost \$600.00) used 2 days \$400.00
- 1—5 HP Besser Vibrapac Motor with 90 lb. brake \$400.00
- 1—90 lb. brake (fits in place of 75 lb.) both for \$300.00

- 1—K-3 Super tamper completely rebuilt with direct motor drive, automatic pallet feeder, Mold vibrator, front conveyor, air lifter. Attachments for making 2, 3, 4, 6, and 8x18 block. Also 6x18 and 8x18 header. 1600 pallets.

- 1—Portland 50 ft. Mixer, overhauled—New blades. Machine, Mixer and Attachments to be sold as used. No reasonable offer refused.

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FOR SALE

One Dunn Champion Drain Tile Machine. 4 to 10" capacity complete with motor and numerous extra parts, used three months \$850.00

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Marion Electric Shovel

1 1/2 Yard

Model No. 37

Serial No. 5626

All new wiring

Machine in good working condition

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KIRK & BLUM VIBRATING Table with 3 H.P. Motor side plates and channels. Never used.

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McCracken Type—PROVED to last as long or longer—yet cost considerably less. Write for prices.

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(Less Chassis)

PROMPT DELIVERY

10-JAEGER 4 YARD
Separate Engine Drive
200 gal. Water Tank
25 gal. Flush Tank

Excellent Working Condition

May be inspected at:

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STEARNS MODEL "A" CLIPPER

STRIPPER

Excellent Condition
Attachments for making 4", 8" and 12" sizes.

Many extras included.

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A used 2 unit George Super "V" Dual Vibrator Block Machine with Preas Pac. and electric motors. A self-fed storage hopper and a set of partition block attachments. With this we have 1500 8x8x16 pallets, 250 Pileter pallets, 250 4x8x16 pallets that go with the machine. Our reason for selling is that we have a new block machine. Best offer takes all.

ACME CEMENT BLOCK CO.

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FOR SALE

50 Steel racks—72 block capacity, manufactured by Lewis Shepard. Only slightly used \$25.00 each—or \$250.00 all to one party. Cash.

BOLT LUMBER COMPANY

Box 56 Cadillac, Mich.
Ph. 1252

One new 100 barrel bulk cement storage bin compl. with scales, bucket elevator and screw conveyor at an attractive price.
1 new 2 compartment aggregate bin 105 ton cap. compl. with 1 yard weigh batcher and scales for same.

FANNING SCHUETT ENGINEERING CO.
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MI. 4-1230

"Manufacturer of these scales and equipment"

FOR SALE

Brand New Miles Power Tumper and used Miles Face down block machine with lever operated strike-off and 650 plain steel pallets. FOB—Indianapolis, Ind. \$800.00
Used Lewis-Shepard lift truck with rubber tired wheels and springs. Nice condition. FOB—Indianapolis, Ind.

R. S. GEYER

876 Mass. Ave. Indianapolis, Ind.

BLOCK PLANT EQUIPMENT FOR SALE

2 Kirkham Vibrators, excellent condition, and everything for complete plant including "Cinder Crusher", all motors and starter switches, Gear reduction Mixer, 44 steel Racks, Pallets, materials elevator and Hoppers, 4 mold boxes and attachments for all popular sizes blocks and brick. One Westinghouse Welder. Will sell all or part very reasonable.

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Mayfield, Kentucky

FOR SALE

WE MADE A MISTAKE . . . WE BOUGHT TOO MANY

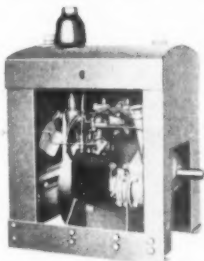
These engines are brand new . . . never used . . .

LE ROI ENGINES

NOT WAR SURPLUS

NOW WE OFFER THEM AT SACRIFICE PRICES . . .

MODEL VP-5 • 2 CYLINDER • 8 HP • 1200 R.P.M.



Specifications:

Engine only, 2 cylinder 2 7/8" x 3 1/2"

Gasoline Carburetor

Air Mase Oil Bath

Magneto

Fan

Radiator

Metal Housing

Gasoline Tank

Muffler

No. 5 Power Takeoff

—Stub Shaft

Weight 385 lbs.

\$185.00

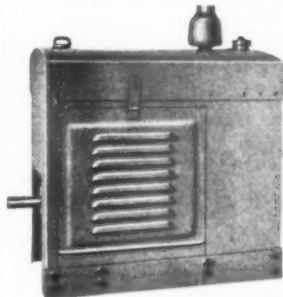
IN LOTS OF 10

\$195.00 for single units

FOB Chicago

15 units in stock

MODEL D-91 • 15 HP • 4 CYL. • 1200 R.P.M.



Specifications:

Engine only, 4 cylinder 2 7/8" x 3 1/2"

Gasoline Carburetor

Air Mase Oil Bath **\$240.00** each

Magneto

Fan

Radiator

Metal Housing

Gasoline Tank

Muffler

No. 5 Power Takeoff

—Stub Shaft

Weight 480 lbs.

IN LOTS OF 10

\$250.00

for single unit

FOB Chicago

50 units in stock

Seeley 3-0303

THOMAS HOIST CO.

20 South Hoyne Avenue

Chicago 12, Illinois

FOR SALE

1—Hyster 20 Fork Lift Truck

1—Budget 2000 lb. Electric Hoist

1—5 H.P. three phase motor

Excellent condition, priced for quick sale.

ASHLAND VAULT INC.

Ashland, Ohio

FOR SALE

STEARNS LATE MODEL STRIPPER

with 4" 6" 8" 12" steel pallets including

Mold Boxes.

Reason for selling CHANGING OVER

To Make Knighton Marble Face Blocks.

NEW JERSEY BLOCK PRODUCTS CO.

Michigan Ave. Kenilworth, N. J.

Unionville 2-0088

FOR SALE

1—1938 Model D216F International 10 wheeler.

Timken Axles, 8 25 x 20 rubber with 2 1/2 yd.

Jaeger Transit Mixer.

1—1938 Model C-35 International 10 wheeler, Graco

Axles, 7 20 x 20 rubber with 2 1/2 yd. Jaeger

Transit Mixer.

All in fair shape—Both outfits \$3000.00

MOHAWK VALLEY CONCRETE CO.

Catskill, N. Y.

FOR SALE

GRAVELEY VIBRATING BLOCK MACHINES

Makes (2) 4" and (1) 8" block

at a time. Capacity 3000 a day. With

motor—new vibrator. Can make 16x16"

Chimney Block too.

Wm. M. CHASE

15 Linwood Ave. Buffalo 2, N. Y.

FOR SALE

FOR SALE

- 1-Kent Tamper Model Triple B
- 1-Kent Block Machine
- 1-Kent 12 cu. ft. Mixer (With new liners)
- 1-Kent Feeder
- 1-Kent Elevator-15'x8"
- 1-Heat Pack Boiler 585,000 BTU's per hour, for steam curing
- 1-Cess pool mold for Kent Machine
- 875-Regular 8x8x16 Press steel pallets
- 125-Single corner 8x8x16 Press steel Pallets
- 75-Single corner and tash cor Press steel pallets
- 500-(Approx.) plywood pallets for cess pool attachment
- 300-Regular 4x8x16 press steel pallets
- 1-Complete set of 4" attachments for Kent machine
- 1-Complete set of cesspool attachments for Kent machine
- All in very good condition.
- 1-10 H.P. Electric motor 220 volts, 3 phase. All entrance switches, knock out boxes, line starters, and push button stations.
- One steel and wooden bin 25 tons capacity. Made by us, can be shipped knocked down.
- All belting, pulleys and line shafting.
- Best offer accepted, owner has other business.

Contact Box H-64, Concrete Products,
309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE

Besser Super K-3 Tamper, fully automatic—6½ molds per minute. Completely overhauled 3 months ago, with 3½, 5½, 7½, 9½, and 11½ attachments. Also attachments for 9½, and 11½, return corners and Man-hole Block. With 3600 ¼x12½x18½ plain pallets, front end conveyor and air off-bearing hoist. Machine also equipped with vibrator. Can be seen in operation. Mixer and racks for this machine also available.

WEST BEND CONCRETE PRODUCTS CO.
West Bend, Wis. Phone 464-W

FOR SALE

(20) ft. length Conveyor with 18" width belt. 2 H.P. motor. Fabricated Steel legs raising one end 8' high.

Wm. M. CHASE
15 Linwood Ave. Buffalo 2, N. Y.

FOR SALE

Two Jackson & Church Brick making machines, LATE MODELS. One Model A. Will produce 3000 to 3500 brick an hour. One Model C. Will produce 1500 to 1800 brick per hour. Almost new with mixers and motors, perfect condition.

P.O. Box 894 Atlanta, Ga.

One Besser Super Vibra-Pac Block Machine and 40 cu. ft. Mixer for immediate delivery. Equipment 1½ years old and in A-1 condition with guarantee—90 racks—1800 Pallets—2 platform trucks—1 fork lift truck—12 and 10 and 8 inch Mold Boxes. \$40,000.00.

Box H-66, Concrete Products, 309 W. Jackson Blvd., Chicago 6, Ill.

- 1 Stearns Jolterete No. 9 complete with mold boxes and hydraulic lift
- 1 Stearns Block Machine
- 1 Batch Mixer
- 1 Continuous Mixer
- 100 Steel Racks
- 3000 12" Pallets
- 4000 8" Pallets
- 1 Gas engine Hydraulic Lift Truck
- 2 Hand Trucks
- 2 Ford Delivery Trucks
- Miscellaneous Electric Motors, spare parts, plant ready to operate in Detroit
- Over \$20,000.00 value—must sacrifice to close Estate \$9500.00. Terms.

THOMAS V. LO CICERO
2362 National Bank Building
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UNBREAKABLE PALLET RINGS

Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE MOTOR BARGAIN

28 Brand new Westinghouse Motors, 2 H.P., 3 phase, 220-440 in original crates—clean and perfect. With Manual starters, each \$40.00. FOB Des Moines, Iowa.
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One—New 20'-12" Screw Conveyor, complete with casings, covers, reducer and 3 H.P. Motor. Price \$450.00.

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CONCRETE BUILDING UNITS CO.
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FREE SERVICE for BUYERS

Here is the quick way to get information and prices on machinery and equipment. Just check the item (or items) listed below about which you desire information. Then send this page to us, and we will take care of the rest.



.....Admixtures, Aggregate
.....Aftercoolers, Air
.....Aggregates (special)
.....Air Compressors
.....Air Separators
.....Asphalt Mixing Plants
.....Bagging Machines
.....Bags
.....Barges
.....Batchers
.....Belting, Conveyor,
.....Elevator, Power
.....Transmission
.....Belting, V-Type
.....Belt Repair Equipment
.....Bin Level Indicators
.....Bins and Batching
.....Equipment
.....Blasting Supplies
.....Block Machines
.....Concrete Building
.....Bodies, Trailer
.....Brick Machines and
.....Molds
.....Buckets
.....Buildings
.....Cans, Industrial

.....Classifiers
.....Clutches
.....Coal Pulverizing
.....Equipment
.....Concentrating Tables
.....Concrete Mixers
.....Concrete Mixing
.....Plants
.....Concrete Specialty
.....Molds
.....Concrete Waterproofing
.....and Dampproofing
.....Conveyors
.....Crushers
.....Coolers
.....Cranes
.....Derricks
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.....ment, Sand
.....Diesel Engines
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.....Generator Sets
.....Grinding Media
.....Gypsum Plant Ma-
.....chinery
.....Hard Surfacing Ma-
.....terials
.....Haulers
.....Hoppers
.....Kilns: Rotary, Shaft,
.....Vertical

.....Locomotives
.....Lubricants
.....Mills
.....Pulverizers
.....Pumps
.....Scales
.....Screen Cloth
.....Screens
.....Scrappers: Crushed
.....Stone, Gravel
.....Shovels, Power

.....Speed Reducers
.....Tanks, Storage
.....Tractors
.....Trucks, Industrial
.....Trucks, Mixer Body
.....Trucks, Motor
.....Vibrators
.....Welding & Cutting
.....Equipment
.....Winches
.....Wire Rope

If equipment you are in market for is not listed above, write it in the space below.

Send to:

**Research Service Department
ROCK PRODUCTS**

309 W. Jackson Blvd.

Chicago 6, Illinois

Your Name..... Title.....

Firm Name.....

Street.....

City..... State.....

CP-6

In excellent condition, used little, you drive it home. Model No. 421 High dump L. T. Smith Transit Concrete Mixer, 100 cu. ft. Drum Volume, 2.50 cu. yd. Mixing Capacity, powered by auxiliary 4 cylinder Waukesha gasoline engine mounted on 1941 International truck. Individually owned. Must sell. Make offer.

Apply—

ATLAS INDUSTRIES, INC.
Woodville, Ohio

Stainless Steel Welding Rod—1/4" diameter and 5/32" diameter. Ideal for welding all types heavy rock and concrete machine parts. Best rod made for manganese castings, 40c per lb. f.o.b. your shop. Minimum order 100 lbs. Write for free Samples and list of other welding items.

COOPER SUPPLY CO.
1816 N. Keystone St. Burbank 1, Calif.

FOR SALE

1—Practically new outdoor overhead crane, 24' span, 20' runway, 31' lift, cap. 5 tons; Chisholm-Moore 2 ton hoist, floor control. \$2,700.00
1—Pennsylvania Class TA 24"x10" Vacuum pump, Flywheel, no motor. Rebuilt. \$1,500.00

ENGINEERED SALES
Alamo Nat'l Bldg., San Antonio, Texas

Miles face down tamper with auto. feed 1000 8" pallets. Attachments for rock, panels and 12" blocks.
Mixer and 3 motors and racks.
This is all nearly new.
Price \$1500.00 at David City, Nebr.

L. E. McBRIDE
Hotel Nebraskan Lincoln, Nebr.

FOR SALE

47 Acre washed sand and gravel plant, with complete cement block plant in connection.

GOSHEN SAND AND GRAVEL
Box 331 Goshen, Ind.

FOR SALE

1—Barrett Cravens Power On Lift Truck, Model POK 9-11-60. Extra battery and Charger. Price \$750.00.
1—Fairbanks Morse 12-100 Stoker, Will fire 23.5 HP boiler. Price \$200.00
F.O.B. Mishawaka, Ind.

CONCRETE PRODUCTS CORP.
2700 W. Ewing Ave., Mishawaka, Ind.

FREE BLOCK MACHINES

Several different makes if you purchase the pallets from me.
Joltretes, Bessers, Appley's, Graveley's, and others.

Wm. M. CHASE
15 Linwood Ave. Buffalo 2, N. Y.

STEEL PALLETS FOR SALE

8x16 Incoit 20 cents ea.
8x16 window sash pallets 20 cents ea. fob.
One 7 Stearns with 4" and 8" mold boxes like new. Price \$2600.00
One 20 H.P. Electric motor with starter switch 3 phase. Price \$175.00

J. E. MURPHY & SON • Belton, S. C.

FOR SALE

12000 lbs. of cement coloring and waterproofing as sold by Dunn Mfg. Co. Original cost 10c lb. MAKE US AN OFFER We sold our Dunbrik Mach., now goes the coloring.

MASONRY PRODUCTS CO.
Columbia City, Ind. Ph. 493

FOR SALE

1—5 H.P. 3 ph De Villiers compressor A-1 condition.
1000—8" aluminum cored pallets, 500—4"—25"—12", A-1 condition.
25 Steel racks, capacity 48 blocks, condition good.

RAUSCH BROS.
Wilmet, Wis. Ph. Wilmet 833

FOR SALE

985 Aluminum Pallets, 4x16, 3 core. Entire lot \$150.00.

WHEATLEY CONCRETE PRODUCTS CO.
Waverly, Kentucky

1—Kirkham vibrating Concrete Block machine 8x8x16. Hand operated. Very good condition.
500 Steel Pallets, 300 Wood pallets.
1—Almost new. 9 cu. ft. blade type mixer.
Contact:

CHAS. WILSON CONSTR. CO.
Norfolk, Nebraska

\$15,000 Block Plant—capacity 6000 8x8x16 blocks per day.
1—FC George 3 unit super vibrator block machine.
2—Roo George 2 unit Super vibrator twin block machines, 7,000 all sizes partition and regular block pallets. Now in operation complete with 1 and 2 bag mixers, augers, hoppers, conveyors and all accessories—a complete plant. Other business interest reason for selling. No reasonable offer refused.

DR. A. B. CRANE
P.O. Box 208 Phone 147 or 371 Pascagoula, Miss.

CEMENT COLORS

CEMENT COLORS—Write for samples and prices of "LANSCO" CEMENT COLORS in bright shades of RED, YELLOW, GREEN, BLUE, BLACK, BROWN. Manufactured by

LANDERS-SEGAL COLOR CO.
73 Delevan St. Brooklyn 31, N. Y.

CONCRETE BRICK CEMENT COLORS MORTAR COLORS

made by
BLUE RIDGE TALC CO., INC.
Henry, Virginia

CINDERS, PUMICE FOR SALE

IDAHO WHITE PUMICE

A car load or a train load. Our supply is unlimited. (Processed ready to use.) This same pumice used in Blocks to obtain Fire Underwriter's B-4 approval.

POCATELLO PUMICE COMPANY
231 W. Center St. Pocatello, Idaho
Phone 555

ANTHRACITE CINDERS

A car load or a train load. Our supply is unlimited. Processed ready to use. Locations on Baltimore & Ohio, Pennsylvania, and Lehigh Valley Railroads.

ROY P. McMINDES COMPANY
105 Mace Avenue Baltimore 21, Md.
Phone: Essex 179

EQUIPMENT WANTED

WANTED TO BUY

Besser Block Machine Molds as follow:
1—8x4x16 Mold
Both Molds complete less vibrator
UNIVERSAL CONCRETE PRODUCTS CO.
P.O. Box 4066—Station A
San Antonio, Texas

POSITIONS VACANT

POSITIONS VACANT

WANTED—Sales Representatives, calling on concrete products plants and building supply dealers, to add our nationally known cement and mortar colors. Commission. Territory you travel may be open.
Write Box H-56, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE OR LEASE

One of the most modern and complete brick manufacturing plants in the middle west, in excellent condition and now operating and doing a good business. Located on paved highway with private railway switch, in heart of industrial section of city of 65,000. Company has exclusive franchise for Lake and part of McHenry counties, Illinois, with no competition. The plant totally dominates the trade area.
Normal capacity 15,000 per day. Complete in every respect with automatic machinery, trucks, racks, etc., plant conveniently constructed with two alternating steam curing rooms with daily capacity.

Building and all improvements also company owned, capable of housing all materials; with favorable land lease with Railway Company at only \$255.00 per year—more land space available for expansion. Plant operates with small personnel and expense, with one managing executive. Plant grounds entirely enclosed with Industrial Cyclone fence, improved with paved cement drives for delivery to stock pile.

Open daily for inspection, must be seen to be appreciated. Management forced to retire because of ill health. Brick manufactured in seven modern colors—many leading contractors use this product exclusively in residential and industrial construction.
Sacrifice price for limited period, \$25,000, plus maintained stock inventory of approximately 1,000,000 brick. If lease desired, satisfactory terms may be arranged. We are member of "Dodge Company Reports" with advance information on all construction in area. Time now perfect—with benefit to buyer of completed building contracts.

Write Box H-65, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE

Going Lightweight Slaglite Block Mfg., Concern; on Main highway Rte. No. 8, Bedford, Ohio; about half way between Cleveland and Akron. 2 acres land 100x300; Pennsylvania RR siding. Factory, warehouse and office 40x100; Kilns and Dryer 40x75; Includes boiler room and 2 utility buildings, block machine and equipment. Total price buildings land, equipment, less trucks; Capacity 8 hour day, 3400 blocks. \$52,000.

STEPHEN SZARAZ
689 Broadway Bedford, Ohio

FOR SALE

Fully equipped plant for manufacturing 4", 6", 8" cinder or sand blocks. Located in brick business community. RR siding. Present capacity 1500 blocks per day.

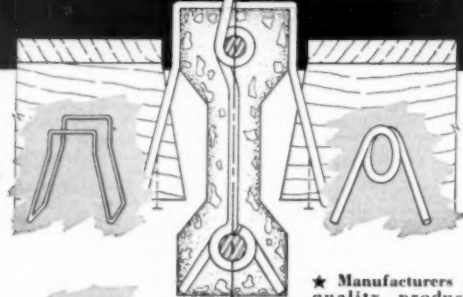
JAMES E. GROOMS & SON
702 N. Cayuga St. Ithaca, New York

Complete Block Plant now operating, daily capacity 2200 units per day, Stearns equipment one year old, building 102x32, own sand pit. Six miles from Atlantic City, N. J. Reasonable. For information write:

MRS. F. MARTINS
124 N. Mississippi Ave.
Atlantic City, N. J.

the new

Centered STIRRUPS AND CHAIRS, WIRE FORM HANGERS for Precast Concrete Joists



★ Manufacturers of quality products used to reinforce and support the reinforcing bars in precast concrete joist fabrication. Wire Form Hangers made of No. 11 gauge wire provide a faster method of floor installation. "Specials" made on request. Literature, Prices or samples on request.



AUTOMATIC SPRING COILING CO.

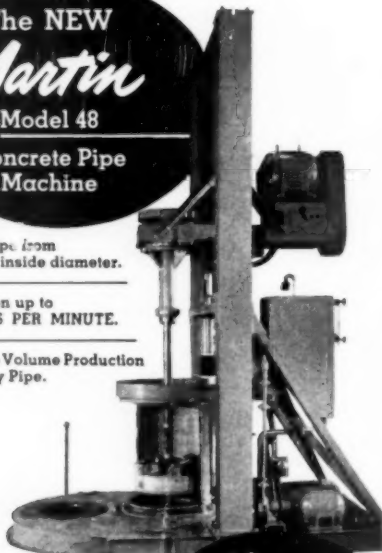
4049 WEST THORNDALE AVE., CHICAGO 30, ILL.

The NEW *Martin* Model 48 Concrete Pipe Machine

Makes pipe from 4" to 24" inside diameter.

Production up to 2 JOINTS PER MINUTE.

For Large Volume Production of Quality Pipe.



Backed by more than 40 years experience in the manufacture of concrete pipe equipment and irrigation gates and valves.

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"Low Over-All Costs With My BLUE BRUTE Teams,"

Says Jim Slaterry

Here are facts — not promises — about how Blue Brutes cut construction costs. Mr. James M. Slaterry, of the nationally known Slaterry Contracting Co., Inc., Woodside, N. Y., writes:

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"All our compressors and air tools are used on a wide variety of jobs under vastly different conditions. We have learned we can rely on Blue Brutes to give us satisfactory performance on any drilling job."

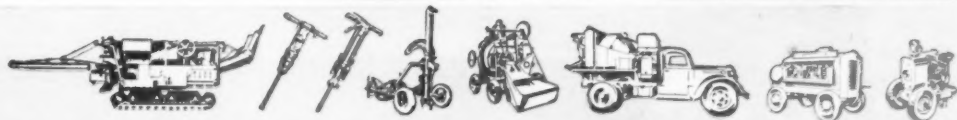
Once again you can be selective in buying construction equipment — can refuse to accept anything but top quality and immediate delivery. Get further facts proving there's more worth in a Blue Brute from your nearby Worthington-Ransome Distributor, or write us direct.

169-1

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Construction Equipment Department
Harrison, New Jersey
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IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB



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Blue Brute 500' Portable Compressors deliver a steady supply of air through their easy-breathing Feather*Valves. (2) One of the UMW-40 Blue Brute Wagon Drills — fast, powerful drilling machines that swing into action at any angle. (3) Two of a battery of Blue Brute Hand-Held Rock Drills — hard slugging, precision balanced, easy handling WJ-55's.

*Reg. U. S. Pat. Off.

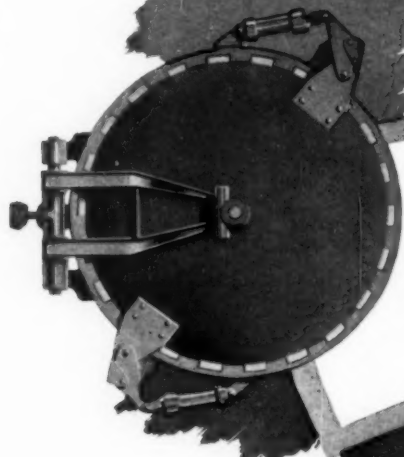
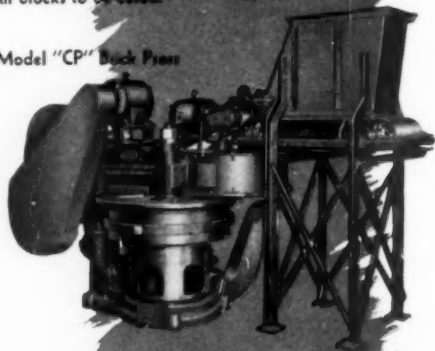


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J & C HIGH PRESSURE CURING EQUIPMENT PLUS A J & C BRICK PRESS.

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- .. produce up to 14,000 perfect concrete or sand lime brick per 8 hour shift
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OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
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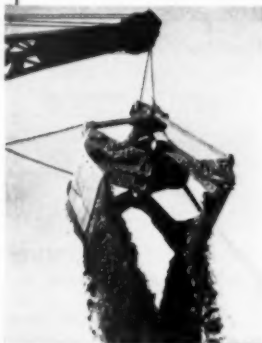


The fact that all the horsepower goes through the coupling emphasizes the importance of protecting direct-connected machines against misalignment.

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OF BLAW-KNOX COMPANY
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THE MOST COMPLETE RANGE OF SIZES AND TYPES

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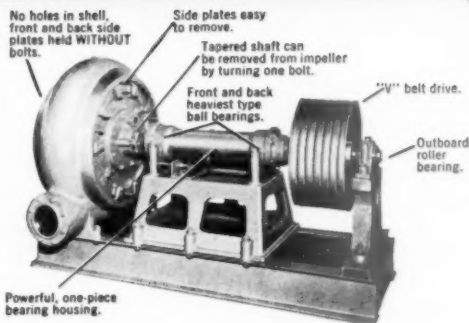
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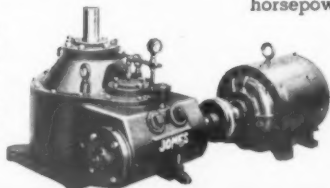
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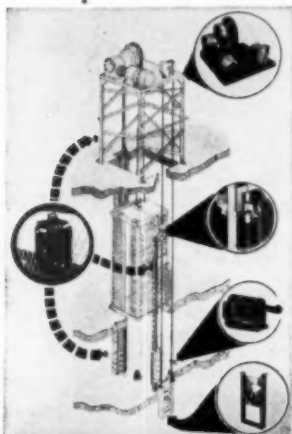
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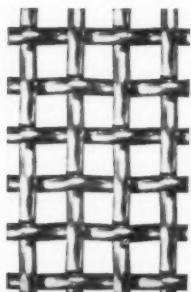
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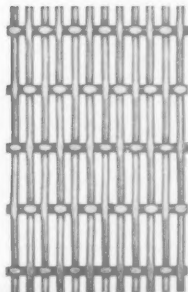


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For Accuracy, Capacity and Durability

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VALVE-TYPE
PASTED AND SEWN

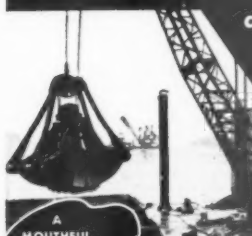
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FOR SALE

Belt Conveyors and Feeders

30" belt conveyors, roller bearings
30" belt conveyors, roller bearings
18" and 20" flat conveyors, roller bearings
42" belt conveyors
24" belt conveyor, plain bearings
18" belt conveyor with and friction idlers
18" belt conveyor with plain bearings
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Climax 10"x20" jaw crusher
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Heavy duty roll crusher, 18"x28", corrugated
American Pulverizer, type ST-T
40"x12" heavy duty roll crusher
AC 2D gyratory reduction crusher, Short head

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Seco vibrating screen, 4'x10', two deck
Pioneer 4 deck vibrating screen, 4'x8'
Tyler electric type 400, single deck, 4'x8'
Seco vibrating screen, 3'x8', two deck
Selecta vibrating screen, 3'x8', two deck
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New No. 253 steel thimble chain with attachments
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Will furnish spaced or cont. bucket elevators

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Crusher; condition excellent.
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5 H.P.
1—Waukesha Engine, type JL 17 B, 4
cyl., 92 H.P.

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1—4 1/2 Ton Plymouth Gasoline Locomotive,
Model F.L.H., 36" gauge.
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1—5'x12' Hardinge Rod Mill, No. R-206,
with lining, drum feeder and trun-
nion discharge. Complete with her-
ringbone gear drive and 125 h.p.
Burke induction motor, type EM-40,
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smith, 20x30 RB Univ. & Iowa, 30x42 Buchanan,
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24" Traylor, 16", 16", & 30" McCully GYR.
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3 & 4 1/2 Bell Raymond High & Low Side Mills,
24"x100" Belt Conveyor, 30"x40" Pan Conveyor,
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15 & 18x10, Pioneer 18x20, Universal 16x24, New
Holland 24x12 & 16x12; McLanahan 30'x60", 18x
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Isay No. 40 & No. 70; Grondler 2XR & 3XR;
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40 hp 220-440 1500 GPM at 90' head.

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6'x20, 7'x12, 8'x10, 8'x12, 9'x16, 9'x30, 10'x16, 10'x20, 10'x20, 10'x20, 10'x20, 11'x24, 12'x24, 12'x26, 13'x24, 13'x30, 14'x20, 15'x24, 15'x30, 18'x30, 18'x30, 24'x30, 42'x48, 48'x42, 30'x42, 40'x48, 42'x60, 60'x42

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Portable secondary crushing plant with
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—20 ton—Practically New Boiler—Good
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Universal portable secondary crushing
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42"	5	1/8"	1/16"	20"	5	1/8"	1/32"
36"	6	1/8"	1/16"	20"	4	1/8"	1/32"
30"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	5	1/8"	1/16"	16"	4	1/8"	1/32"
26"	5	1/8"	1/32"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"

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Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	3"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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I.D. Size	Length	per Length	I.D. Size	Length	per Length
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1"	25 "	6.25	"	50 "	13.00
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5—5'x12' Two Surface Tyrock F-600
Screens. Complete with Motors.

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This Equipment New
Has Never Been Operated

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vator with 110-14" 6-ply Rubber
Belting (used one season) 110
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Above equipment in A-1 condition,
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2 B E 15B Shovels 1 1/2 yd.....	ea. \$ 7,000.00
2 P&H 255A 3/4 yd. Shovels or Draglines.....	ea. \$ 9,500.00
2 Lorain MC-4 20 ton Motorcranes.....	ea. \$16,000.00
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1 P&H 255A 20 ton Truckcrane.....	\$15,500.00
1 NW-25 3/4 yd. dragline gas motor.....	\$ 8,000.00
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Lying in England. Grinding plant suitable for Cement manufacture:

1 Sillex lined tube mill	18'x6'
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This plant is in good condition and can be inspected in England. Immediate shipment. Payment in sterling. Reply:

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Special—Lippmann 18x32 port. hammermill with or without Waukesha motor.

Link Belt car puller	Bay City 25 dragline	Badger port. gravel plant
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All above equipment reconditioned to our own plant.

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3/4 Yard Buckeye Shovel Front.
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Buchanan 40"x18" Doyle C wheel jaw crusher.
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Whitcomb 7-ton gas locomotive, 30" ga., rebuilt.
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Above Rock Crusher Equipment has
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1-45', Rubber belt 7/16"x24", 11 Roller carriers, 5 idlers, 3 H.P. Motor 1140 rpm, variable speed reducer, worm gear.
1-Auger type, 16' long with horizontal 16" dia., 32' long, 7 1/2 H.P. Motor 1750 rpm, 220-440 V.
1-Auger type, 16", 20", Water cooled, 5 H.P. Motor, 1740 rpm, link belt speed reducer, flexible coupling.

1-20' rubber belt, 24", 8 carriers, 1 idler, 5 H.P. Motor, 1200 rpm.
1-Komarek-Grates, 14"x14" with Master Gear Head, 3 H.P. Motor, 1725 rpm.

1-Komarek-Grates, air cooling 113', 3 H.P. Motor, Ratio 1725 to 29.9.

1-20' x 30' long, water jacketed, paddle screw, 7 1/2 H.P. Motor, double drive, with flexible coupling, Link Belt gear reduction unit, 17 1/2 H.P. Motor.

1-Double Chain 16', 1 1/2 H.P. Motor, 220/440 V 1730 rpm with Link Belt gear reduction unit, 16 to 3/4, flexible coupling chain drive.

1-24' rubber belt, 62", on 15 carriers, 11 idlers, 5 H.P. Motor, 1725 rpm, gear chain drive.

1-20' rubber belt, 62", on 16 carriers, 8 idlers, 7 1/2 H.P. Motor, with 6"x12"x14", 30' bucket elevator.

PUMPS-1-Centrifugal, 1 1/2"x2", 3 H.P. Motor, 1700 rpm, 3 Ph.
3-Centrifugal, 2"x2 1/4", 5 H.P. Motor, 1750 rpm, Meyers.

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Model 3 Northwest shovel and drag-line 1 yd. buckets, \$8,000.00.
International Diesel Motor P.D.40 with enclose clutch and V-belt pulley, \$750.00.

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All Machinery in first class condition.

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Lippman 18x24 lime pulverizer with Lippman feeder and Caterpillar D11000 engine mounted on one chassis. One 40"x18" conveyor; one 4 yard bin, all overhauled last winter and in good shape. Priced to sell or will trade for gravel secondary screening plant.

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- 1-25" x 40" Cedar Rapids Roller Bearing Jaw Crusher, New
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 - 1-No. 1 McCully Gyratory Crusher, Used
- Attractively Priced for Quick Sale. Now in our Los Angeles Warehouse. Inspection invited.
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EXHAUST FANS-1-with Multiple V-belt drive, 25 H.P. motor.

2-Gas, Sturtevant, Size 5, Form M, 1700 CFM, Flanged inlet and outlet, 3 H.P. Motor, 220 V., 60 Cy., 1800 rpm.

1-Gas, Sturtevant, No. 2, 500 CFM, Flanged inlet and outlet 1 H.P. Motor, 3 Ph., 60 Cy., 220 V., 1800 rpm.

GAS COMPRESSOR-Worthington H.B., 26"x 12" with controls, 100 H.P. Motor, 1175 rpm, 9 S-beave, 1 1/2" belt drive, 29'x9" long.

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Portable Pioneer Primary Crusher Jaw unit trailer mounted White Model 1941, Serial G-571, Factory No. 1853, Order No. 55885, Crushing jaws - 26" wide, 54" deep, Flat belt drive W-2 drive pulleys, Tandem Mount. Now overhauled and located at Pioneer Engineering Works, Minneapolis. Call W. O'Brien, Parts Department.

One 4' deck FA Vibrator screens, 46"x12" long, mesh, 4" to 2".

One Pioneer screen and crushing jaw unit, trailer mounted, 1941 model with Serial C-262 Jaws 37", A-1 condition.

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One North Star Boiler-100 H.P.

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Both with return flue-8" welded steel stack.

Also quantities of plumbing and electrical supplies and connections.

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Minot, North Dakota

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Eucild Loader Model BV5, 7 Terra-Cobra Scrapers, 4-Tournapulle, Euclid Trucks, Tournawagons.

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Red Mills-Gratory Crushers, Ball Crushers, Jaw Crushers 10'x20", 15'x20", 15'x26", 30'x24", 24'x36", 26'x12", 42'x60", some portable some with feeders, Cone Crushers 3' and 4', Screens, Feeders, Wagon & Door Classifiers, Jigs, Pumps, Deen Well Pumps, Tuggers, Mine Hoists, Motors, Transformers, Conveyors, Portable Gravel Plants, Road Rollers, Wagon Drills, Blast Hole Drills.

Many other items.

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FOR SALE

1-812 Cylinder Waukesha Motor-Skid frame and V Belt Pulley

1-Model Barker Greene Loader about 14 months use

1-1 1/2 Dipper Stick for Quickway Model E, practically new

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1-Pioneer 305 Revolving Barrel with screens. Approximately \$2000.00 worth of parts for new 305 Pioneer gravel plant

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Buc-Erie 200H Elec. shovel, 6 yd.
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Int. Henshield 25 ton Lom. Crane.
American 25 Ton Locomotive Diesel Powered.

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Cedar Rapids 20x36, 25x40.
Parrell 10x30, 12x36, 14x36, 42x40.
Hushman 30x42, Type C.
Pioneer 24x30 portable with feeder and conveyor.
Traylor 18x36, 24x36.
Austin Western 25x40.
Allis Chalmers 20x18.
Good Roads 10x30.
Telamith 18x32.

Champion 1000, 1040 and No. 6.
Gratory: Allis Chalmers McCully, 6", 7 1/2", 8", 9", 12K, 20", 30".
14" Newhouse, 24" Gyrasphere, 8K, 6K, 5K, gates.
Telamith 5H, 10-B, 13-B, 16-B.
Kennedy Van Saun 7, 10, 25 1/4-8, 38.
Traylor Ty-1-8.
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Roll Mill: Allis Chalmers 4'x4', 5'x8'x18", Kennedy Van Saun 7'x5".
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4 Jaeger 6 yd. agitators on Int. K-11-F.
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1-R 1500 CFM, 100 psi. Electric Drive.
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C-P 1938 CFM, 100 psi. Electric Drive.
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New Penna. 800 cfm; synchronous motor.
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Loomis 6" blast hole, gas, self-primed.
Keystone Model 51 Vertical, complete. Excellent.

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Cat. D7 Series 4T Cable controlled dozer.
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Cat. D4 with T4 tractor 1 yd. bucket.

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Builer 300 ton cement bin 105 ton aggregate bin.
Builer 300 ton 2 compartment aggregate each comp.
400 bin cement complete with elevator, scales, etc.
Johnson 400 yd. complete plant with 8 comp. bin and two Smith 2 yd. mixers. Used four weeks only.

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Madison Asphalt 2000 lb. cap. Complete.
Cedar Rapids Model B asphalt. Complete; 1 job only.
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Universal 800 Crushing Plant, portable on pneu.
Cedar Rapids Pitmaster straight line screening and crushing.
Cedar Rapids Two unit mobile crushing.
Cedar Rapids Model AAA Crushing.

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8 Koppel 5 yd. 84" Ga. Dump Cars.
10 Western 4 yd. 36" Ga. Dump Cars.
Plymouth 20 ton gas loco. Std. ga.
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Volcan 12 ton gas loco. 36" ga.
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Baldwin 50 ton steam 84" Ga.
Volcan 25 ton steam loco. Std. Ga.
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American Terry 20 ton Guy Derrick 100' bm.
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Cortland 7-0723 Cable: RICHWALSH

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2 Raymond No. 45 Imp Mills with Manganese hammers, separators, blowers, etc.

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1 Raymond 4 Roll Low Side Pulverizer

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8 Heavy Duty Double Arm Jacketed Mixers 5 gal. to 150 gal.

7 Heavy Duty Hammer Mills up to 150 HP

1 Abbe Silex Lined Tube 4'x22' with helical intake and discharge

1 Gayco 8' Air Separator

8 Rotary Dryers up to 10'x90'

6 Rotary Kilns up to 9'6"x250'

Send for complete specifications

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DRAGLINE: 4 yd. capacity, 110' boom, 2200 volt, A.C.

SHOVEL: Bucyrus Erie 54-B, 2 1/2 yd., D77000, rotary motor.

DRILLS: Bucyrus Erie 29-T, gas, 9" bits, NEW, 2-Electric, used.

MOTOR: G.E. to H.P., 3 phase, 60 cycle, 220-440 volt, 1765 RPM, with V-belt pulleys and belts, starter, etc.

GOODRICH SUPER LONG LIFE CON-VEXION BELT NEW: Large quantity of Goodrich Belt 42" wide, 6 ply, 12 oz. duck, 7/32" top cover, 1/16" bottom cover, all original with all NEW, NATURAL RUBBER, with or without mechanical parts.

CRUSHING PLANT: Portable, diesel powered.

GYLATORY CRUSHERS: 1-30" and 42", complete with motor and drive, 1-Allis Chalmers 9-K and 6-K, 1-Austin No. 8, 20" opening with feeder, 1-Telamith 16-B, all steel, 15" opening.

JAW CRUSHERS: All sizes 48" to 48x60".

REDUCTION CRUSHERS: Traylor type T2, size 30", Kennedy model 37 with motor integral; Telamith 32-B complete with V-belt pulley; Allis Chalmers type R322 fine reduction; Traylor type TY 14".

ROLL CRUSHERS: Jeffrey 18x24 double roll for coal, coke, clinders, etc. Allis Chalmers 54'x200", NEW condition.

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DERRICK HOIST: National 3 drum, 80 H.P., shop No. 4626, with 15 H.P. separate electric, 3 phase, 60 cycle, 220, 440 volt.

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1-250 H.P. single drum, 7'x25", 30,000 lbs. single line pull, 750 FPM, complete.

1-200 H.P. single drum, 42" face, 60" dia., C, 2200 volts and controls.

1-150 H.P. double drum, 38" dia., 42" face, 440 volt A.C., complete with controls.

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MODELS 150-A and CH 150.....\$175.00 to \$435.00 EACH
SPECIAL ITEMS WHILE THEY LAST

DEMPSTER DUMPSTER—Model 200 LF.....\$475.00

Ding Magnetic Separator with 18" conveyor, complete with controls, etc.
Barrett Lift Trucks—model J-K-19-11-42.....\$85.00 each
Misc. blowers, filters, gear reducers, motors, switches, etc. Some new.

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2675 Grand Avenue Chicago 12, Illinois

FOR SALE

50 ton Whitcomb diesel electric locomotive. New in 1943.

30 ton Whitcomb diesel mechanical locomotive. New in 1943.

35 ton Ohio Locomotive crane. Gas powered. New.

1 1/2 yard Lima 601 diesel crane and shovel combination.

3/4 yard Johnson clamshell bucket. New.

Mississippi Valley Equipment Co.
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FOR SALE

1-78 x 18 HRT Boiler ASME 200-lb. pressure with stoker.

2-135 HP Murphy Diesel engines, direct connected to 85 KW 3 ph., 60 cy., 240 volt generators.

2-200 HP Economic fire box boilers 125-lb. allowable pressure. Builer 1933.

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TRACK ACCESSORIES
MIDWEST STEEL CORPORATION
CHARLESTON 21, W. VA.
KNOXVILLE, TENN. - PORTSMOUTH, VA.

FOR SALE

1—Universal Screening Plant complete with 3X8 double deck Simplicity screen.

1—150 H.P. Cummings Diesel Power Unit.

1—4XA Gruender Hammer Mill 24x36

SPROULE BROS., Elizabeth, Ill.

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305 W Pioneer Washing Plant; 23 yd. steel Iowa gravel bin, good as new.

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1—3 yd. Page Dragline Bucket R.H. New
1—215 cu. ft. Davey Gas Portable Compressor
1—3 yd. Link Belt Model 75 Gas Shovel and Crane
1—1½ yd. Northwest No. 6 Diesel Shovel
1—40-19 Northwest Diesel Shovel
2—10-ton American Terry all steel stiffing Derricks
1—25-ton American Diesel Locomotive Crane, New 1942
1—38-ton Ohio Diesel Locomotive Crane, New 1948
1—40-ton Orton Diesel Loco. Crane, New 1941
1—D7 Tractor w/ Cable Blade DDPCC, 4T Series

B. M. WEISS COMPANY

Girard Trust Co. Bldg., Philadelphia 2, Pa.
Rittenhouse 6-2311

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CORE DRILLING

—anywhere!
"We look into the earth!"
**PENNSYLVANIA
DRILLING COMPANY**
Pittsburgh 20, Pa.

POSITIONS VACANT

WANTED

Mechanical Engineers and draftsmen experienced on conveyors, rock crushers, asphalt plants, coal washers, etc. Mostly hard work, design layout, and detailing. Write fully giving experience, education, personal history and salary required.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa

WANTED

**SOUTHERN OHIO CEMENT PLANT
ASSISTANT SUPERINTENDENT**

Need capable, experienced, well qualified man—Opportunity for early advancement. Write Box H-63, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill., giving full particulars.

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**Quarries
Crushing Plants
Cement Plants
Storage Methods
Operating Costs**

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Plant Layout
Design
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Construction**

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FOR SALE

The services of 14,034 salesmen all with 31 years experience selling your machinery to the producers in the non-metallic minerals field.

Salary: 1 to 3 inches
\$8 an inch
4 to 8 inches
\$7.75 an inch
9 to 14 inches
\$7.50 an inch

Guarantee—to call on 27% more potential buyers than anyone else serving the industry.

O.K. ROCK PRODUCTS

Please put your 14,034 salesmen to work for me by placing the copy below in the classified section of the next issue of ROCK PRODUCTS to occupy inches of space

Name
Company
Address
City State

EQUIPMENT WANTED

WANTED

Used crusher feeder, 3' x 12' minimum with overlapping links. Box H-62, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED

Rotary Kilns:

Size 11', 10', 9', 8', 7' and 6' dia, 100' or longer.

Compeb Mills:

6' and 7' dia.

Tube Mills:

3', 6' and 7' dia.

OLLIE E. LAWRENCE
P.O. Box 688 Quincy, Mich.

WANTED

Jaw Crusher with or without feeder, 20"x36".

M. WENZEL

2136 Jefferson St. Kansas City, Mo.

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WANTED: General Superintendent and Quarry Foreman with granite experience. Two year job in Southeast. State salary and experience. Box H-49, Rock Products, 309 W. Jackson, Chicago 6, Ill.

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EXCELLENT GRAVEL DEPOSIT

On 120 acre modern farm—(ultra modern home, etc.) 50 miles from Chicago. 42 foot deposit of gravel over an area of 40 acres. Prefer having gravel deposit leased out on royalty basis but will sell all.

A real buy—must be seen to be appreciated.

Write or phone A. M. BRODY
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Tel. Woodstock 1659-J-1

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**IN DENVER: THE HEART OF
THE WEST'S BUILDING BOOM
LEADING PRE-MIX CONCRETE PLANT
MODERN EQUIPMENT**

Over One Million Dollars' worth of
Signed Bond Fide orders included

FOR INFORMATION

Write — Wire

CLINE AND HARDESTY, INC.

9350 E. Colfax Avenue
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FOR SALE

Silica Sand Plant in Western Pennsylvania. Can be seen in operation.

Write Box H-60, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

Rock Plant and land complete—going business in desirable Southern California location.

(250 tons per hr.)

Asphalt Plant—transportation equipment transit mix trucks and batching equipment.

Write Box H-58, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE CHEAP

Gypsum plaster plant, with or without leases on plenty of high grade gypsum passing government tests. Plant is now in operation and is the only one in the state.

SOUTHWESTERN GYPSUM CO., INC.
Dunlap, New Mexico

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POSITION WANTED: I am in the middle forties and want to establish residence in Florida. Having thirty years sales experience in the building construction field, I am seeking a distributorship or a sales representative position in that state. Materials or construction equipment. Box H-67, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED: As Chief Chemist in Cement Plant. Well qualified with twenty years experience in analyzing both wet and dry cement process. Desires position available in three months. Write Box H-50, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

Cement manufacturing technician available near future. Experienced in design, development and operations. Excellent references. Box H-59, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

Experienced in design, erection and operation of cement plants. Wet and dry process. Foreign service preferred. Box H-52, Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.



"Cape Ann" Forged Steel Drop Ball

Investigate the use of a "Cape Ann" FORGED STEEL Drop Ball for secondary breakage! Our New Design permits cable to be attached thru rugged forged link rising from neck of drop ball minimizing cable wear.

2000 to 8000 lbs.

**ALL SIZES IN STOCK
Immediate Shipment**

For further information write—

**Cape Ann Anchor &
Forge Co.**

Post Office Box 360
Gloucester, Mass.

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BAUGHMAN

*Customized



Self-Unloading Bodies do more jobs for more profits

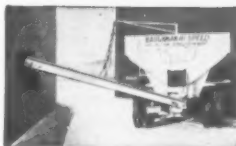
MORE THAN JUST A LIME SPREADER!

Also spreads phosphate, delivers coal and grain into bins, transfers loads. Belt-over-drag chain model also spreads and unloads road rock, chips, gravel, other abrasives. **MORE PAYLOAD!** Ruggedly built of high tensile alloy steel . . . 30% lighter, 17% stronger, more abrasion-resistant and 5 times more rust-resistant than if built of ordinary steel. Result: more payload with less dead weight . . . less wear and tear on truck and tires.

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PHOSPHATE SPREADER ATTACHMENT covers 2 acres per mile traveled . . . from 100 to 2000 lbs. per acre . . . up to 15 miles per hour. 16½ ft. wide . . . folds for highway travel. Easily attached or removed.



SWIVEL CONVEYOR ATTACHMENT delivers anywhere in a half-circle — up-down-right-left. Eliminates time-wasting truck maneuvering. Perfect for working in confined space. One-man operation — controls at rear of body.



TRANSPORT BODY. Large in size yet light in weight for more payload. Baughman Bodies are available in 9 to 33 cu. yd. capacities.

We invite your inquiry also on our conveying and elevating equipment . . . **WRITE FOR FULL INFORMATION.**

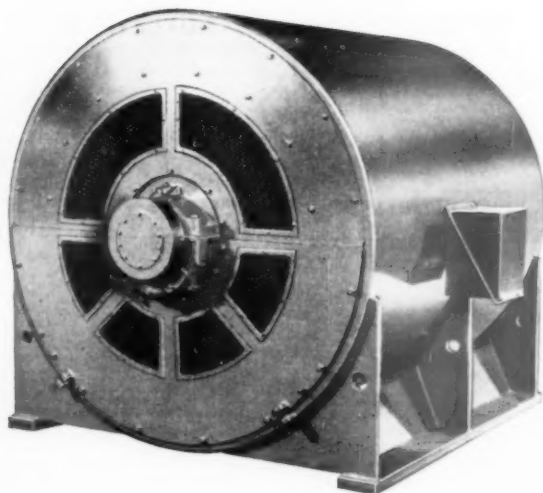
Some distributor and dealer territories still open.



BAUGHMAN MANUFACTURING CO., Inc.
401 Shipman Rd. Jerseyville, Ill.

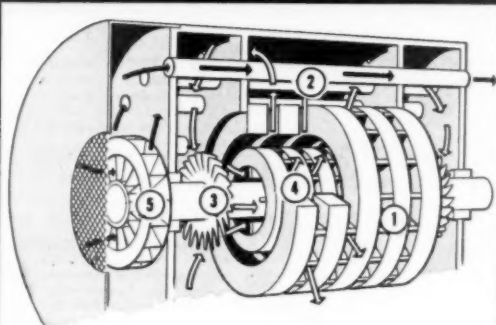
"There is a Baughman Distributor Near You!"

**TUBE-TYPE
TOTALLY-ENCLOSED
FAN-COOLED
MOTORS!**



INSTALL INDOORS or OUT!

How Tube Cooling Works



Stator core (1) is surrounded by tubes (2). Internal fans (3) circulate air through ducts (4) in rotor and stator and around tubes, transferring heat to tubes.

External fan (5) drives outside air through tubes, removing heat and keeping tubes clean. All electrical parts are enclosed. Dirt cannot enter.

- ☛ **Dirt-proof and corrosion-resistant**
- ☛ **Heat exchanger is practically self-cleaning**
- ☛ **Simple self-contained cooling system—sizes from 75 to several thousand horsepower**

WHEREVER DUST, DIRT, fly ash, rain and snow, smoke, or corroding fumes keep motor maintenance costs high, this Allis-Chalmers tube-type motor will cut maintenance sharply.

All electrical parts—including stator core—are enclosed. Simple heat transfer system keeps temperatures well within rated limits. Cleaning is rarely needed because air passages are unrestricted. Air flow through the straight tubes removes foreign matter.

Important savings have been proved in three years of field operation. Sizes from 75 hp and up. Also explosion-proof designs. For complete information, outline your requirements to your A-C Sales Office, or write for Bulletins 05B7150 and 51R7149.

A-2610

ALLIS-CHALMERS, 975A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS



In river gravel . . .

Dual Impact Action does it again



INSTALLATION, Canby, Oregon. $1\frac{1}{2}$ " minus material from pit is screened out ahead of crusher. All $1\frac{1}{2}$ " plus material goes through.

DUAL IMPACT ACTION cuts crushing costs . . .

Boosts aggregate production. Read about it—then see it for yourself.

- 1. READ** what Les Gibson of Canby Sand and Gravel, Canby, Oregon, has to say about the New Holland Model 200 Double Impeller Breaker his firm bought last fall. Here are the highlights:

"... BETTER THAN WE BELIEVED POSSIBLE

"We are operating in a river gravel deposit. The size of material ranges from sand to a maximum of 18". We have never found rock in the pit that could not be crushed in this 20 x 20 machine.

"... it is my sincere conviction that this crusher will operate at cost of $\frac{1}{3}$ — $\frac{1}{4}$ that of a conventional rock processing plant."

- 2. SEE** what Les Gibson's Model 200 is doing at Canby, or get in touch with your New Holland distributor. Let him suggest a nearer installation. See the rock that goes in; study the aggregate that comes out—quality and quantity.



CLOSE-UP, New Holland Model 200 at work. Canby Sand and Gravel. Les Gibson says "... have fed crusher at rate of in excess of 100 yards per hour ... crusher has shown no evidence of being loaded."

REMEMBER whatever your crushing problem . . . New Holland has the answer. Double Impeller Breakers come in 4 sizes; work in all kinds of rock; are easily adapted to open or closed circuit operation.



NEW HOLLAND DOUBLE IMPELLER BREAKERS

NEW HOLLAND MANUFACTURING COMPANY, MOUNTVILLE, PA.

Affiliate of The Sperry Corp.



They tote thousands of tons per day

in the world's deepest limestone "mine"

BURIED half a mile under Ohio is the world's deepest "quarry"—a mine that produces limestone at the rate of thousands of tons per working day. And every ounce of that river of rock rides on Goodyear Conveyor Belts for much of the way between the working faces of the mine and storage bins located on the surface.

When the mine owner called in the G.T.M.—Goodyear Technical Man—to recommend the belts best suited to conveyerize the operation, he specified Goodyear Stacker Conveyor to carry the limestone from crusher to storage bins—both located deep in the mine. Three belts—each 42" wide, 7-ply construction—were installed to handle this part of the operation. The G.T.M. recommended Stacker Conveyor because Stacker's extremely tough covers and bonding breaker are more than strong enough to handle the severe abrasion of the rock.

At the shaft head, the crushed rock travels from head frame to storage bins via nearly a half mile of Goodyear 6-ply, 32-oz. duck belting, installed on seven different conveyors handling various sizes of rock.

Altogether, this mine uses a total of ten Goodyear conveyor belts—all installed in accordance with the recommendations of the G.T.M. His recommendations can be your own best insurance of economical, long-life conveyor belt haulage, either above ground or below surface. It will pay you to consult the G.T.M. first. Write him c/o Goodyear, Akron 16, Ohio.

For Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

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THE GREATEST NAME IN RUBBER